

APPENDIX 4.1-1C

Land Exchange Alternative Fire Protection Plan

**Otay Ranch Village I4 and Planning Areas I6/I9 –
Land Exchange EIR Alternative
Fire Protection Plan**

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
CSA	County Service Area
DPW	San Diego County Department of Public Works
FMZ	fuel modification zone
FPP	Fire Protection Plan
HOA	Homeowner's Association
MSCP	Multiple Species Conservation Program
NFPA	National Fire Protection Association
RMP	Resource Management Plan
SDCFA	San Diego County Fire Authority
SRP	Subregional Plan
WFEP	Wildland Fire Evacuation Plan
WUI	wildland/urban interface

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Otay Ranch Village 14 and Planning Areas 16/19 – Land Exchange EIR Alternative Fire Protection Plan

EXECUTIVE SUMMARY

This Fire Protection Plan (FPP) is for the Otay Ranch Village 14 and Planning Areas 16/19 – Land Exchange EIR Alternative (Land Exchange Alternative) in San Diego County, referred to as Village 14 and Planning Areas 16/19 by the Otay Ranch General Development Plan/Subregional Plan (Otay Ranch GDP/SRP). This FPP provides measures for fire protection which meet the 2017 San Diego County Consolidated Fire Code and the Land Exchange Alternative will be required to meet the codes at the time of construction. It also identifies the fire risk associated with the Land Exchange Alternative's proposed land uses, and identifies requirements for fuel modification, building design and construction and other pertinent development infrastructure criteria for fire protection. The primary focus of this FPP is providing an implementable framework for suitable protection of the planned structures and the people living in the Land Exchange Alternative. Tasks completed in the preparation of this FPP include data review, code review, site fire risk analysis, land use plan review, fire behavior modeling, and site specific recommendations.

Where possible, this FPP incorporates principles of sustainability that are an important component of the Land Exchange Alternative. Preservation and conservation of resources, including energy, water, and native plant communities within the Otay Ranch RMP/MSCP Preserve is an important component of the Land Exchange Alternative and has been duly considered and integrated into this FPP, where it does not lessen fire protection.

The Land Exchange Area is located in southwestern San Diego County (County) between the City of Chula Vista and the community of Jamul. The Land Exchange Area is approximately 2,347 acres, of which approximately 1,002 acres are within Village 14 and 1,345 acres are within Planning Areas 16/19. A portion of the 1,002 acres within Village 14 is proposed for the development of a master-planned, residential community with adjacent, Otay Ranch RMP/MSCP Preserve. At build-out, the Land Exchange Alternative will include approximately 409.5 developed acres (including residential, school, public safety, commercial and circulation). Approximately 1,937.5 acres are designated to preserved and managed open space. The Land Exchange Alternative will be built in three phases (North Village, Central Village, and South Village) and will include single-family and multi-family residential, mixed-use, retail/commercial, a public safety site, an elementary school site, park and recreation facilities, and related water, sewer, electrical and roadway infrastructure necessary within a planned community.

Fire service will be provided by San Diego County Fire Authority (SDCFA) from a centrally located, station that is capable of responding to the entire Land Exchange Alternative within the County's General Plan 5 minute travel time standard. SDCFA will serve the Land Exchange Alternative because it is located within their jurisdiction and the County has indicated it can and

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will provide fire and emergency medical response. The only other fire agency in the area is Chula Vista Fire Department (CVFD), but the Land Exchange Alternative is not within their jurisdictional area and neither of the two closest CVFD fire stations can provide service to any of the proposed structures within the County's General Plan 5-minute travel time standard.

The structures in the Land Exchange Alternative will be built using ignition resistant materials pursuant to the most recent County Fire and Building Codes (Chapter 7A – focusing on structure ignition resistance from flame impingement and flying embers in areas designated as high fire hazard areas) which are the amended California Fire and Building Codes and will be complemented by an improved water availability, capacity and delivery system; fire department access; monitored defensible space/fuel modification; interior, automatic fire sprinkler systems in all structures, monitored interior sprinklers in applicable structures; and other components that will provide properly equipped and maintained structures with a high level of fire ignition resistance.

The fire risk analysis resulted in the determination that wildfire has occurred and will likely occur near the Land Exchange Area again, but the Land Exchange Alternative would provide ignition resistant landscape and structures and firefighters will have defensible spaces with implementation of specified safety measures. Based on modeling and analysis of the Land Exchange Area to assess its unique fire risk and fire behavior, it was determined that the California and San Diego County standard of 100-foot-wide Fuel Modification Zones (FMZs) or an alternative will be suitable to protect the Land Exchange Alternative from an anticipated wildfire that may burn in the fuels adjacent to the developed areas. This 100-foot wide fuel modification zone, when properly maintained, has proven effective at minimizing structure ignition from direct flame impingement or radiant heat, especially for structures constructed using the latest ignition resistant codes. The FMZs will be maintained in perpetuity by a funded Community Facilities District or Homeowner's Association (or similarly funded entity), ensuring that the required fuel reduction work occurs annually.

In addition to the code-required fire protection features, the Land Exchange Alternative provides additional measures including heat-deflecting landscape walls at strategic perimeter locations to augment the FMZs and to provide additional perimeter protection for homes that occur with a downslope at the edge of a rear yard, as discussed in more detail in this FPP.

This FPP provides a detailed analysis of the Land Exchange Alternative, the potential risk from wildfire, and potential impacts on the SDCFA, as well as analysis on meeting or exceeding the requirements of the County of San Diego. Further, this FPP provides requirements, recommendations, and measures to reduce the risk and potential impacts to acceptable levels, as determined by the SDCFA.

Otay Ranch Village 14 and Planning Areas 16/19 – Land Exchange EIR Alternative Fire Protection Plan

1 INTRODUCTION

This Fire Protection Plan (FPP) has been prepared for the Otay Ranch Village 14 and Planning Areas 16/19 – Land Exchange EIR Alternative (Land Exchange Alternative). The purpose of the FPP is to evaluate the potential impacts resulting from wildland fire hazards and identify measures necessary to adequately mitigate those risks to a level consistent with County thresholds. Additionally, this plan generates and memorializes the fire safety requirements of the Fire Authority Having Jurisdiction (FAHJ), which is the San Diego County Fire Authority (SDCFA). Wildfire protection will continue to be provided by CAL FIRE. Requirements and recommendations detailed in this FPP are based on site-specific characteristics, applicable code requirements, and incorporate input from the applicant and the FAHJ.

As part of the assessment, the FPP has considered, amongst other site factors, the property location, topography (including saddles, chutes, chimneys), geology, combustible vegetation (fuel types), climatic conditions, and fire history. The FPP addresses water supply, access (including secondary access where applicable), structural ignitability and ignition resistive building features, fire protection systems and equipment, potential impacts to existing emergency services, defensible space, and vegetation management. The FPP identifies and prioritizes areas for potentially hazardous fuel reduction treatments and recommends the types and methods of treatment that will protect the community and essential infrastructures. The FPP also recommends measures that property owners and the homeowner's association will take to reduce the probability of structure ignition throughout the area.

The Land Exchange Alternative is located within the boundaries of SDCFA in the unincorporated portion of San Diego County. This FPP addresses SDCFA's and CAL FIRE's response capabilities and response travel time within the Land Exchange Alternative along with projected funding for facilities improvements and fire service level maintenance.

The following tasks were performed to complete this FPP:

- Gather site specific climate, terrain, and fuel data.
- Process and analyze the data using the latest GIS technology.
- Predict fire behavior using scientifically based fire behavior models, comparisons with actual wildfires in similar terrain and fuels, and experienced judgment.
- Analyze and guide design of proposed infrastructure.
- Analyze the existing emergency response capabilities.

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- Assess the risk associated with the Land Exchange Alternative.
- Collect site photographs and map fuel conditions using 200-scale aerial images. Field observations were utilized to augment existing digital site data in generating the fire behavior models and formulating the recommendations presented in this FPP. Refer to Appendix A, Photograph Log, for site photographs of existing site conditions.
- Prepare this FPP detailing how fire risk will be mitigated through a system of fuel modification, structural ignition resistance enhancements, and fire protection delivery system upgrades.

1.1 Intent

The intent of this FPP is to provide fire planning guidance and requirements for reducing fire risk and demand for fire protection services associated with the Land Exchange Alternative. To that end, the fire protection “system” detailed in this FPP includes redundant layering of measures including: pre-planning, fire prevention, fire protection, passive and active suppression and related measures proven to reduce fire risk. The fire protection system planned for the Land Exchange Alternative has proven through real-life wildfire encroachment examples throughout southern California, to reduce the fire risk associated with this type of project.

1.2 Applicable Codes/Existing Regulations

This FPP demonstrates that the Land Exchange Alternative will comply with applicable portions of the 2017 Consolidated Fire Code or the most current fire and building codes at the time of tentative map approval. The Land Exchange Alternative also will be consistent with the 2016 California Building Code, Chapter 7A, the 2016 California Fire Code, Chapter 49, and the 2016 California Residential Code, Section 337 as adopted by San Diego County. Chapter 7A of the California Building Code addresses reducing ember penetration into homes, a leading cause of structure loss from wildfires. Thus, code compliance is an important component of the requirements of this FPP given the Land Exchange Alternative’s wildland urban interface location which is within an area statutorily designated as a Very High Fire Hazard Severity Zone (VHFHSZ) by CAL FIRE (FRAP 2015). Fire hazard designations are based on topography, vegetation, and weather, among other factors with more hazardous sites including steep terrain, unmaintained fuels/vegetation, and wildland urban interface (WUI) locations. Projects situated in VHFHSZ’s require fire hazard analysis and application of fire protection measures to create defensible communities within these WUI locations. As described in this FPP, the Land Exchange Alternative will meet applicable code requirements for building in these higher fire hazard areas, or meet the intent of the code through the application of site-specific fire protection measures. These codes have been developed through

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decades of wildfire structure save and loss evaluations to determine the causes of building loss during wildfires. The resulting fire codes now focus on mitigating former structural vulnerabilities through construction techniques and materials so that the buildings are resistant to ignitions from direct flames, heat, and embers, as indicated in the 2016 California Building Code (Chapter 7A, Section 701A Scope, Purpose and Application).

1.3 Land Exchange Alternative Summary

1.3.1 Location

The Land Exchange Area, located in southwestern San Diego County, encompasses approximately 2,347 acres, including certain land owned by the State of California in Village 14 and Planning Area 16 in addition to all of the land owned by the applicant in Village 14 and Planning Areas 16/19, within the Proctor Valley Parcel of the Otay Ranch GDP/SRP planning area. The Land Exchange Area is located approximately 0.25 mile east of the City of Chula Vista and 1.8 miles southwest of the community of Jamul (Figure 1, Regional Map).

Additionally, the Land Exchange Alternative Land Exchange Area is located northeast of Upper Otay Reservoir and is bordered by open space to the northwest and southeast. More specifically, the Land Exchange Alternative is located predominantly southeast of Proctor Valley Road, within the northern half of Section 30, eastern half of Section 19, western half of Section 20, and southwest quarter of Section 17 of the Jamul Mountains U.S. Geological Survey 7.5-minute quadrangle, Township 17 South, Range 1 East.

Regional access to Village 14 is provided by SR-125, located approximately 3 miles to the west. I-805, approximately 8 miles to the west, provides secondary north/south access. SR-54, located approximately 6 miles to the northwest, connects to SR-125 and I-805, and provides regional east/west access. State Route 94 is approximately 2 miles to the east and provides north/south travel.

Proctor Valley Road provides the main access to the Land Exchange Alternative. Five roundabouts identify the entrance into each residential area as well as provide traffic calming at key internal intersections. The internal circulation plan also includes a series of collectors and residential streets built to public road standards (though some will be private roads) to provide fire access throughout the residential neighborhoods. Proctor Valley Road is an existing rural improved two-lane road and is a County Designated Scenic Highway. The northern connection of the Land Exchange Alternative to Jamul will be in the alignment of the existing partially improved Proctor Valley Road and will provide both public and emergency services access to both communities.

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The Land Exchange Alternative's circulation plan incorporates vehicular and non-vehicular modes of transportation to create an integrated system of roads, bike lanes, trails, pathways, and sidewalks.

1.3.2 Vicinity Land Use

Existing land uses surrounding the Land Exchange Area vary from highly urbanized areas to open space lands (Figure 2, Vicinity Map). Development is primarily concentrated around Rancho San Diego to the north and the rural community of Jamul to the northeast. Existing development, including the Eastlake Vistas, Rolling Hills Ranch, and Bella Lago residential communities located to the southwest of the Land Exchange Area and Upper and Lower Otay Reservoir and the proposed Resort Village (Village 13) are located to the south and southeast. Jamul is comprised of primarily large-lot estates, horse ranches, and agriculture.

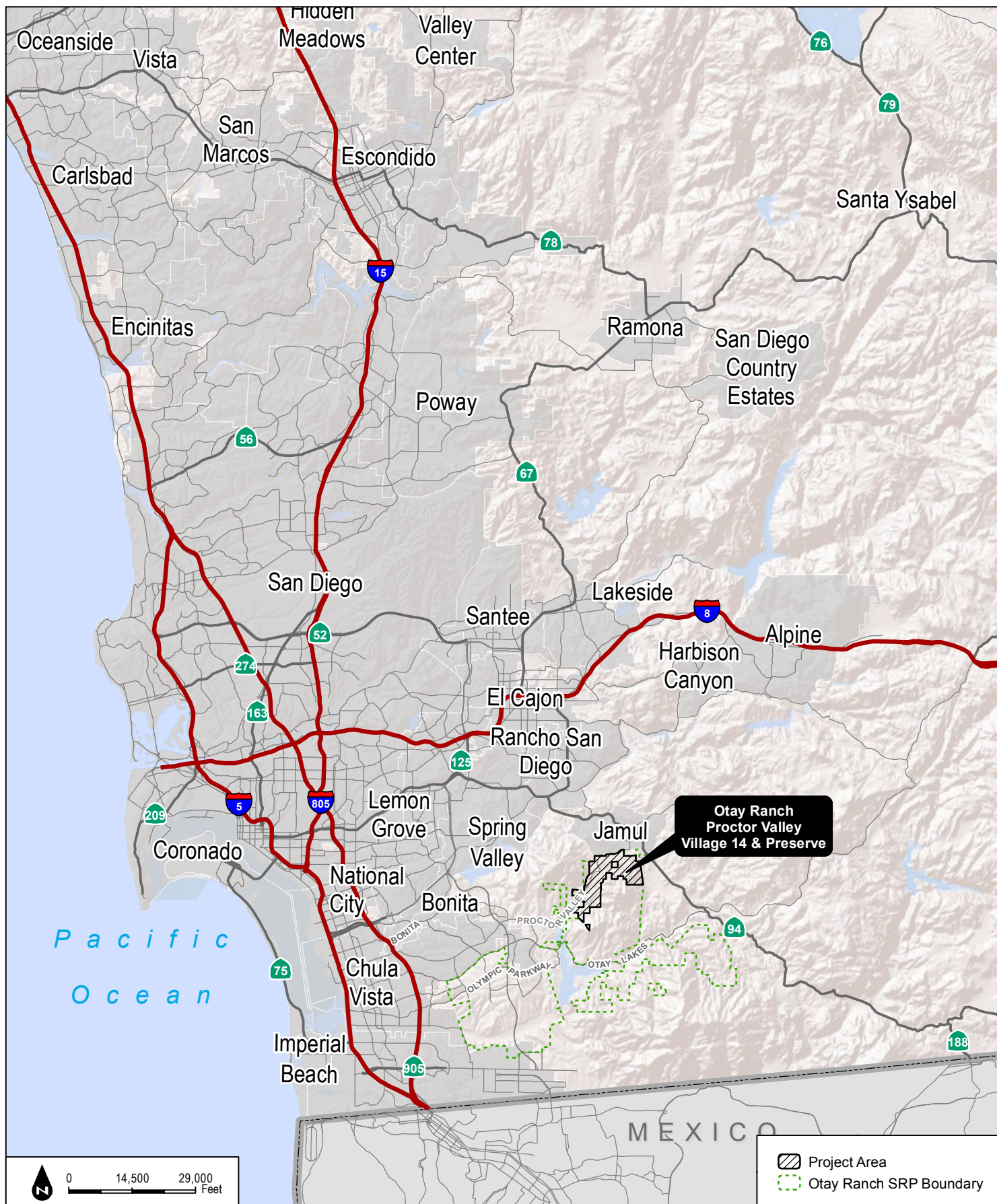
Most of the land in the vicinity of the Land Exchange Alternative to the west and east is undeveloped; some of this land consists of gently rolling hills used for agriculture and grazing; and some is more rugged, steep open space. The San Diego National Wildlife Refuge is located to the west of the Proctor Valley Parcel. The Refuge stretches from Jamul to communities in Spring Valley and eastern Chula Vista. The BLM manages two separate parcels within the northern portion of the Proctor Valley Parcel of Otay Ranch. The large northern out parcel encompasses the Callahan Mountain Peak and some of the tops of side-slopes extending down from the peak. City of San Diego's MSCP "Cornerstone Lands" are located adjacent to the Land Exchange Area to the south.

1.3.3 Land Exchange Alternative Description

1.3.3.1 Overview and Background

This technical report provides a project-level analysis of the Land Exchange Alternative (defined below) for inclusion in the Otay Ranch Village 14 and Planning Areas 16/19 Environmental Impact Report (EIR). The regional location is shown in Figure 1.

The Land Exchange Alternative is located within Otay Ranch Village 14 and Planning Areas 16/19 in the Proctor Valley parcel of Otay Ranch as shown on Figure 2. Village 14 and Planning Areas 16/19 are part of the larger Otay Ranch, an approximately 23,000-acre master-planned community in southern San Diego County designed as a series of villages and planning areas.



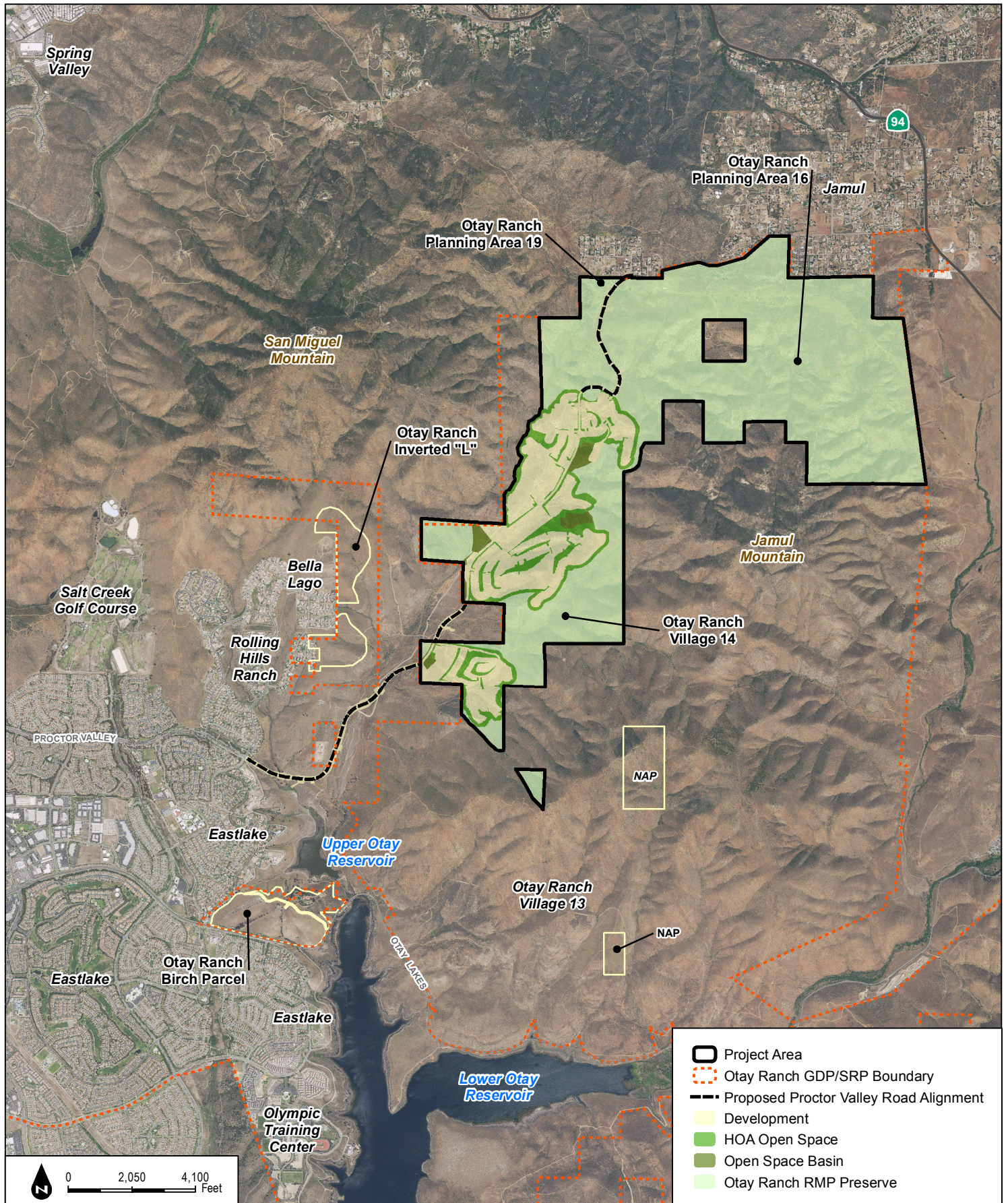
SOURCE: Hunsaker 2017; County of San Diego 1997

FIGURE 1
Regional Map

Otay Ranch Village 14 and Planning Areas 16/19 - Land Exchange Alternative

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SOURCE: NAIP 2016; Hunsaker 2017; County of San Diego 1997

FIGURE 2
Vicinity Map

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The Land Exchange Alternative proposes 1,530 homes within a development footprint that is limited to Proctor Valley Village 14. The majority of Planning Areas 16/19 would be converted to Otay Ranch RMP/MSCP Preserve and would not be developed.

The following describes the major components and characteristics of the Land Exchange Alternative.

1.3.3.2 Definitions

As indicated above, the “Land Exchange Area” is located within Otay Ranch Village 14 and Planning Areas 16/19 as depicted in Figure 3, Land Exchange Alternative Site Map. The total Land Exchange Area covers approximately 2,387 acres, of which the applicant owns 1,294 acres, the State owns approximately 1,053 acres and 39.9 acres are off-site improvement areas. Within the Land Exchange Area, there are 1,003 acres in Village 14 and 1,345 acres in Planning Areas 16/19. Off sites include Proctor Valley Road and related utilities in the south and central portions of Village 14. The State’s ownership is included in order to process a General Plan Amendment to remove existing approved Otay Ranch GDP/SRP County General Plan development land uses and convert these acres to Otay Ranch RMP/MSCP Preserve.

County Defined

The “County” is the County of San Diego and its associated jurisdictional area.

Land Exchange Alternative Defined

The Land Exchange limits development to Otay Ranch Village 14 and converts the majority of development approved by the Otay Ranch GDP/SRP in Planning Areas 16/19 to Otay Ranch RMP/MSCP Preserve. The Land Exchange Alternative assumes the completion of a land exchange agreement with the State of California and a simultaneous boundary adjustment to the MSCP and Otay Ranch RMP Preserve systems.

Specifically, the Land Exchange Alternative proposes the following:

- Exchange 278 acres owned by the State in Village 14 for 278 acres owned by the applicant in Planning Area 16.
- Change MSCP and Otay Ranch RMP Preserve boundaries via a boundary adjustment where approximately 169.8 acres in Planning Areas 16/19 are converted to Otay Ranch RMP Preserve and 142.3 acres in Village 14 are converted to Otay Ranch Preserve and

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43.6 acres in Village 14 are converted to development footprint for a net increase in Otay Ranch RMP Preserve of 268.5 acres.

After implementation, the Land Exchange Alternative land plan is depicted in Figure 3. The Land Exchange Alternative contemplates a Specific Plan, General Plan Amendments, EIR, Rezone, Tentative Map, the Otay Ranch RMP Amendment, and MSCP County Subarea Plan South County Segment Boundary Adjustment.

Village 14 Defined

Village 14 as referred to herein is a discrete subset of the Land Exchange and reflects that portion located exclusively within Village 14 as depicted in Figure 3. The majority of the technical reports focus on Village 14 as this is where the development is planned.

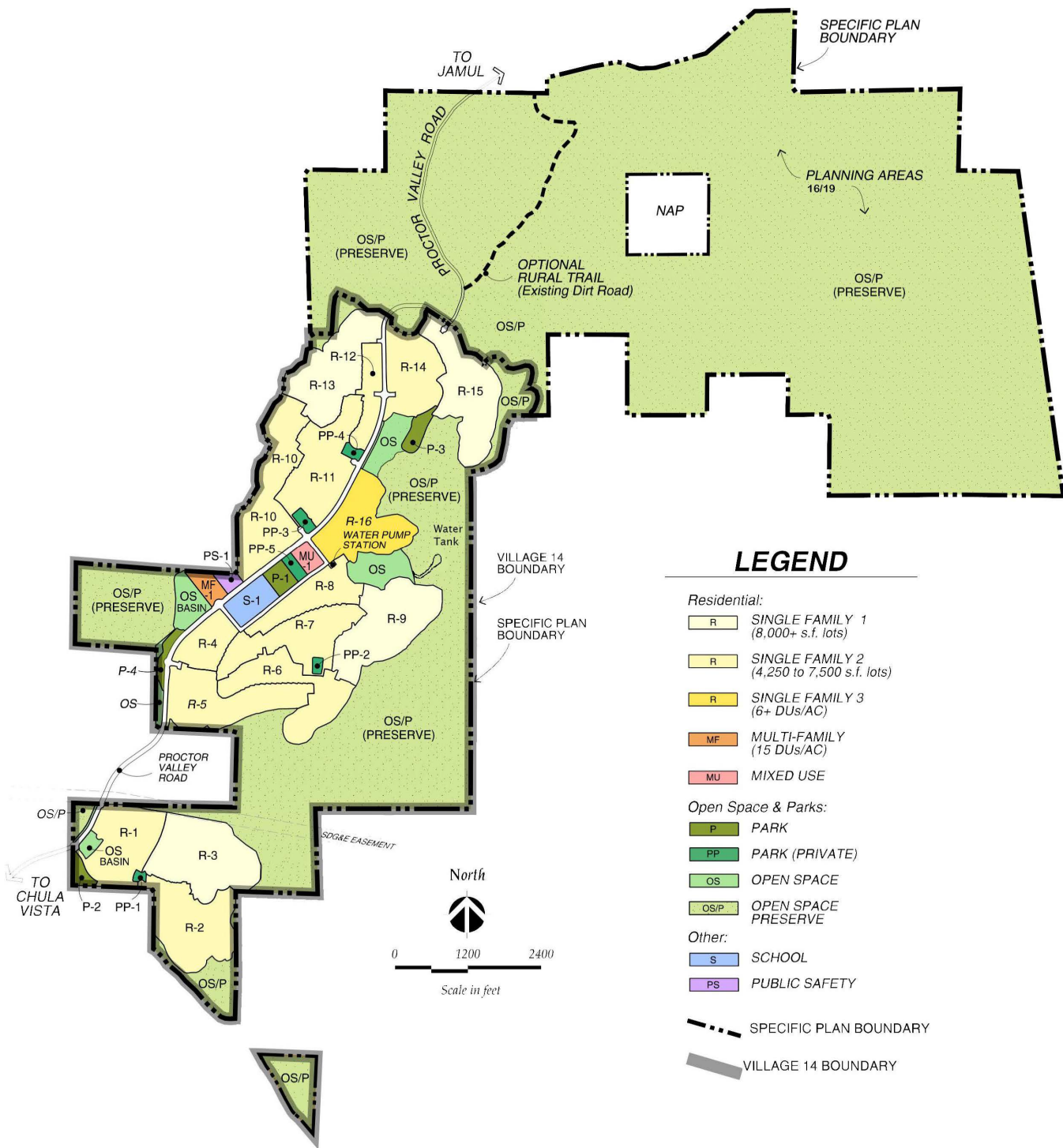
1.3.3.3 *Proposed Specific Plan*

Summary

The adopted Otay SRP requires the preparation of a Site Utilization Plan that describes the land uses. Figure 3 depicts the proposed Site Utilization Plan for the Land Exchange Alternative. Additionally, Table 1 quantifies the land uses.

The Land Exchange Alternative includes approximately 511 acres designated for 1,530 homes, 1,124 of which would be traditional single-family homes, 283 would be single-family age-restricted and 123 would be multifamily homes as indicated on Table 1, below. A total of 18 neighborhoods are planned with approximate densities ranging from 1.5 to 15.0 dwelling units per acre. The age-restricted neighborhoods would be gated, as would four of the single-family neighborhoods situated on the largest lots.

Village 14 in the Land Exchange Alternative is planned around a Village Core, centrally located in the heart of the village. Higher density residential uses will be adjacent to the Village Core with single family residential radiating out in decreasing density. The Village Core is comprised of the Neighborhood Center which includes an 8-acre elementary school; a 4-acre Village Green (public park); a 3-acre Mixed Use Site with up to 15,000 square feet of commercial/retail uses and 54 multi-family homes; and a 2-acre Village Square Community Facility. The Village Core also includes a 2-acre public safety site for a fire station and sheriff's storefront facility and 69 multi-family townhomes located adjacent to the public safety site.



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The Land Exchange Alternative is designed around an active lifestyle and wellness recreation theme and includes an extensive park and recreation system including four public parks totaling 13 acres as depicted in Figure 3. The remaining private recreation facilities include three private swim clubs, a senior activity center, the Village Square community facility and numerous pocket parks totaling approximately 9 acres. Approximately 4.6 miles of community pathway are proposed on the Proctor Valley Road. Approximately 3 miles of Park-to-Park Loop connect to the regional pathway.

After implementing the proposed land exchange agreement, Otay Ranch RMP/MSCP Preserve boundary adjustment, and General Plan Amendment, the Land Exchange Area will include 1,749 acres of land for Otay Ranch RMP/MSCP Preserve, consisting of 404 acres in Proctor Valley Village 14, and 1,345 acres in Planning Areas 16/19.

Circulation and Access

Under the Land Exchange Alternative, regional access to Village 14 would be provided by SR-125, located approximately 3 miles to the west. I-805, approximately 8 miles to the west, provides secondary north/south access. SR-54, located approximately 6 miles to the northwest, connects to SR-125 and I-805, and provides regional east/west access. State Route 94 is approximately 2 miles to the east and provides north/south travel.

Proctor Valley Road would provide the main access to Village 14. Five roundabouts would identify the entrance into each residential area as well as provide traffic calming at key internal intersections. The internal circulation plan also includes a series of collectors and residential streets to provide access to the residential neighborhoods.

Proctor Valley Road is planned as a two-lane road and is designated as a scenic corridor. The Land Exchange Alternative includes an Otay SRP amendment to the classification of Proctor Valley Road from a Four-Lane Major to a Two-Lane Light Collector. The northern connection of Proctor Valley Village 14 to Jamul will be in the alignment of the existing partially-improved Proctor Valley Road and will be paved to provide both public access and secondary emergency access to both communities.

The Land Exchange Alternative's Circulation Plan incorporates vehicular and non-vehicular modes of transportation to create an integrated system of roads, bike lanes, trails, pathways, and sidewalks.

Options

The Land Exchange Alternative includes three options for internal circulation: (1) the Proctor Valley Road North Option, (2) the Preserve Trails Option, and (3) the Perimeter Trail

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Option. The Draft EIR Land Exchange Alternative assesses each of these options and their respective impacts. Each of the options summarized below. For detailed descriptions with exhibits, see the Specific Plan Section VIII, Internal Circulation Options.

Proctor Valley Road North Option: The Proctor Valley Road North Option applies to Proctor Valley Road street section 10 at the northerly edge of Village 14. Street sections 10 would be replaced with street section 10B to provide for two dedicated bike lanes (one on each side of the road) instead of the “sharrows” (sharrows are road markings that guide bicyclists to bike routes between neighborhoods and alert motorists to the presence of bicyclists within the shared travel lane) proposed in the Land Exchange Alternative. Note that Street section 10A provides a transition section at the northerly property boundary and does not change in the Option scenario. Generally, the Proctor Valley Road North Option would increase the right-of-way width from 40 feet to 48 feet.

Preserve Trails Option: The Preserve Trails Option consists of two segments of existing, disturbed trails. These segments would be located within the Otay Ranch RMP Preserve. The Preserve Trails Option includes segments “A” and “B” as identified in the Otay Ranch GDP/SRP, which are also identified as segments 52 and 49 in the County of San Diego’s Community Trails Master Plan (CTMP). Segment “A”/“52” is 4,450 lineal feet, generally located at the northern terminus of Village 14 and extending northeast through the onsite Otay Ranch RMP Preserve to the eastern edge of the Echo Valley loop (CTMP Trail 53). Segment “B”/“49” is approximately 3,100 lineal feet and is located between South and Central Village 14, along an existing, historic ranch road. This trail is located within onsite Otay Ranch RMP Preserve and bisects regional wildlife corridor R1. The Preserve Trails Option would retain these portions of trails in their existing conditions, which meet the CTMP primitive trail standard. No improvements to these Preserve Trails are contemplated.

Perimeter Trail Option: The Perimeter Trail Option is an approximately 4.5-mile perimeter trail located within the Development Footprint of Village 14. The Perimeter Trail Option is situated primarily within the Otay Ranch RMP 100-foot Preserve Edge. The Perimeter Trail Option is designed to CTMP primitive trail standards, and the trail tread varies from 2 to 6 feet wide. Due to topography, trail grades range from 2% to the maximum grade allowed of 30%. The Perimeter Trail Option requires the construction of approximately 5,200 lineal feet (1.0 mile) of 5- to 7-foot-high retaining walls due to steep topography and drainage constraints. The Perimeter Trail Option would be graded as part of overall project grading and does not encroach into the Otay Ranch RMP Preserve. The perimeter trail would be accessed at public parks and trailheads and would be maintained by the County of San Diego.

Dudek has evaluated these options and they are discussed herein.

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Table 1
Otay Ranch Land Exchange Alternative Site Utilization Plan – Land Use Summary

Proctor Valley Village 14		Acres	Units	Density
<i>Residential Uses</i>				
<i>Single-Family Residential</i>				
R-1	SF-2	28.9	112	3.9
R-2	SF-2	37.1	72	1.9
R-3	SF-1	41.7	67	1.6
R-4	SF-2	14.3	57	4.0
R-5	SF-2	33.9	109	3.2
R-6	SF-2	30.6	75	2.4
R-7	SF-2	32.1	91	2.8
R-8	SF-2	20.1	47	2.3
R-9	SF-1	41.5	74	1.8
R-10	Age Restricted SF-1	42.5	127	3.0
R-11	Age Restricted SF-1	34.4	156	4.5
R-12	SF-2	12.3	44	3.6
R-13	SF-1	36.4	66	1.8
R-14	SF-2	26.9	60	2.2
R-15	SF-1	38.5	59	1.5
R-16	SF-3	31.7	191	6.0
Single Family Subtotal		503.1	1,407	2.8
<i>Multi-Family & Mixed Use</i>				
MF-1		4.6	69	15.2
MU-1 ^a		3.5	54	15.5
MF & Mixed Use Subtotal		8.0	123	15.3
<i>Residential Subtotal^b</i>		511.2	1,530	3.0
<i>Non-Residential Uses</i>				
<i>Public Parks</i>				
P-1	Village Green	3.9		
P-2	Overlook Park	4.2		
P-3	South Park	2.9		
P-4	Scenic Park	2.5		
<i>Public Parks Subtotal</i>		13.5		
<i>Private Parks</i>				
PP-1	South	0.8		
PP-2	Central	1.0		
PP-3	Senior Activity Center	1.8		
PP-4	North	1.4		
PP-5	Village Core	1.9		
<i>Private Parks/Recreation Subtotal</i>		6.9		

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Table 1
Otay Ranch Land Exchange Alternative Site Utilization Plan – Land Use Summary

Proctor Valley Village 14		Acres	Units	Density
<i>Public Uses</i>				
Public Safety		2.3		
Elementary School		8.3		
<i>Public Uses Subtotal</i>		10.6		
<i>Open Space & Preserve</i>				
Internal Open Space ^c		33.4		
Otay Ranch RMP/MSCP Preserve		403.9		
<i>Open Space & Preserve Subtotal</i>		437.3		
Circulation Subtotal ^d		23.1		
<i>Non-Residential Uses Subtotal</i>		491.4		
<i>Proctor Valley Village 14 Subtotal</i>		1,002.6	1,530	1.5
Planning Areas 16/19 Preserve				
Circulation in Preserve ^e		16.4		
Otay Ranch RMP/MSCP Preserve		275.4		
Exchange to State for preserve		278.0		
Existing State Ownership (portion)		775.1		
<i>Planning Areas 16/19 Preserve Subtotal</i>		1,344.9		
Proctor Valley Village and Preserve Grand Total		2,347.4	1,530	0.7

Note: Additional off sites excluded from the acreage above include:

- Proctor Valley Road Offsite Central & South 39.9
- Offsite Sewer to Salt Creek Interceptor

^a Mixed Use acreage includes 15,000 sf of commercial use

^b Residential acreage includes 151.6 acres of fuel mod and internal open space slopes and 2.6 acres of private pocket parks.

^c Open Space included 11.3 acres of basins and HOA open space lots not included in the residential acreage.

^d Proctor Valley Road On site in Village 14 only

^e Proctor Valley Road North in Planning Area 16 is in Preserve

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2 LAND EXCHANGE ALTERNATIVE SITE RISK ANALYSIS

2.1 Field Assessment

Following extensive review of available digital site information, including topography, vegetation types, fire history, and the Land Exchange Alternative site plan, Dudek fire protection planners conducted a field assessment of the Land Exchange Alternative on April 27, 2015. Dudek's site assessment was aided by Dudek's biologists who conducted a comprehensive vegetation mapping assignment on the site over the course of several weeks in 2015 and 2016 (Dudek 2017).

Among the field tasks completed were:

- Vegetation estimates and mapping refinements;
- Fuel load analysis;
- Topographic features documentation;
- Photograph documentation;
- Confirmation/verification of hazard assumptions; and
- Ingress/egress documentation.

Site photographs were collected (Appendix A) and fuel conditions were mapped using aerial images. Field observations were utilized to augment existing site data in generating the fire behavior models and formulating the requirements provided in this FPP.

2.2 Site Characteristics and Fire Environment

The following sections discuss the characteristics of the Land Exchange Alternative site at a regional scale. Evaluating conditions at this macro-scale is to provide a better understanding of the regional fire environment, which is not constrained by property boundary delineations or individual developments.

2.2.1 Topography

Topography influences fire risk by affecting fire spread rates. Typically, steep terrain results in faster fire spread up-slope and slower spread down-slope. Terrain that forms a funneling effect, such as chimneys, chute's or saddle's on the landscape can result in especially intense fire behavior. Conversely, flat terrain tends to have little effect on fire spread, resulting in fires that are driven by vegetation and wind.

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The Land Exchange Alternative topography in its current condition is diverse and characterized by a relatively flat valley along Proctor Valley Road and broad gentle hillsides within the remainder of the development area (within approximately 300 feet of the Land Exchange Alternative development footprint) (Figure 2). Areas outside this development footprint include steeper terrain in some areas. The Land Exchange Area is bordered by increasingly rugged terrain of the San Miguel and Jamul Mountains immediately to the northwest and southeast, respectively, with the foothills of these mountains extending into the Land Exchange Area. These slopes are predominantly up and away from the Land Exchange Alternative development footprint. Several small, narrow drainages are present along the eastern edge of the development footprint. A low east-west trending ridgeline effectively divides Proctor Valley near the upper end of the Land Exchange Alternative. Elevations of the Land Exchange Alternative area range from approximately 600 feet above mean sea level (amsl) at the southern end of the property to approximately 1,200 feet amsl in the northeastern portion of the Land Exchange Alternative area. Although slopes can range from 5% up to 40% within the Land Exchange Area, the average slope¹ to about 300 feet outside the perimeter of the development footprint is approximately 19.5%. Slope is important relative to wildfire because steeper slopes typically facilitate more rapid fire spread up slope. The steeper slopes are primarily within the areas designated as Otay Ranch RMP/MSCP Preserve within the Land Exchange Area and will not be developed. The site's steeper slopes ascend away from the developed areas of the Land Exchange Alternative (vs. situations where development occurs at top of slope and the terrain descends away from the developed areas). The slopes are generally in alignment with the extreme Santa Ana wind events, which can influence fire spread by creating wind-driven fires, especially when moving upslope.

2.2.2 Climate

Southwestern San Diego County, including the Land Exchange Area, is influenced by the Pacific Ocean and is frequently under the influence of a seasonal, migratory subtropical high pressure cell known as the “Pacific High” (WRCC 2014a). Wet winters and dry summers with mild seasonal changes characterize the Southern California climate. Local climate, which has a large influence on fire risk, is typical of a Mediterranean area. The climate pattern is occasionally interrupted by extreme periods of hot weather, winter storms, or dry, easterly Santa Ana winds (WRCC 2014a). The average high temperature for the Land Exchange Alternative area during fire season is approximately 83°F, with temperature in summer and early fall months (July–October) reaching up to 102°F. Precipitation typically occurs between December through April

¹ The average slope within 300 feet perimeter buffer was calculated by Hunsaker and Associates using formula from San Diego County's S-1 Policy (2015).

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with annual rainfall ranging from 3.5 to 13.3 inches (CY 2012 to 2014) with lower annual accumulation (3.5 to 5.2 inches) in 2015 due to the current drought (WRCC 2014b, DWR 2015). The prevailing wind is an on-shore flow from the Pacific Ocean, which is approximately 13 miles to the west. Hot, dry (Santa Ana) winds, which typically occur in the fall and are usually from the northeast, can gust to 50 miles per hour (mph) or higher. The Santa Ana winds are due to the pressure gradient between high pressure in the plateaus of the Great Basin and lower pressure gradient over the Pacific Ocean (NOAA 2007). Drying vegetation (fuel moisture of less than 5% for 1-hour fuels is possible) during the summer months becomes fuel available to advancing flames should an ignition occur. Extreme conditions, used in fire modeling for the Land Exchange Alternative, include 92°F temperatures in summer and winds of up to 50 mph during the fall. Relative humidity of 12% or less is possible during fire season.

2.2.3 Fuels (Vegetation)

The Land Exchange Area is currently undeveloped and is composed of a variety of vegetation types that were mapped by Dudek (Dudek 2015). Extensive vegetation type mapping is useful for fire planning because it enables each vegetation community to be assigned a fuel model, which is used by a software program to predict fire characteristics, as discussed in Section 4.1. The site's vegetative fuels are primarily non-native grassland, chaparral, and coastal sage scrub, although smaller pockets of eucalyptus woodland, oak riparian forest, marsh, wetland, and ornamental vegetation types are present. This vegetation is adapted to periodic wildfire events. Fire history data described in Section 2.2.6 indicates that the vegetation last burned in 2007 on the majority of the Land Exchange Area. As such, the vegetation on the property is still in early stages of recovery toward a climax species composition. Small areas of disturbed habitat and urban/developed land cover types are also present within the Land Exchange Area. More detailed information regarding the plant communities within the Land Exchange Area is provided in the Biological Resources Technical Report for the Land Exchange Alternative (Dudek 2017). Vegetation is important relative to wildfire as some vegetation, such as coastal sage scrub and grassland habitats, are highly flammable while other vegetation, such as oak riparian forest, is less flammable due to its higher moisture content, but will burn under certain, more intense fire conditions.

The development footprint will include roads, structures, and landscape vegetation at build-out. Any native vegetative fuels within fuel modification zones will also be modified as a result of development, altering their current densities, distributions, and species composition. Areas within the most influential sphere of influence for direct fire affects (approximately 300 feet outside of proposed development) and fuel modification zones will continue to be dominated by chamise-chaparral, southern mixed chaparral, diegan coastal sage scrub, and non-native grassland fuel beds. These vegetation types were confirmed by Dudek fire protection planners in

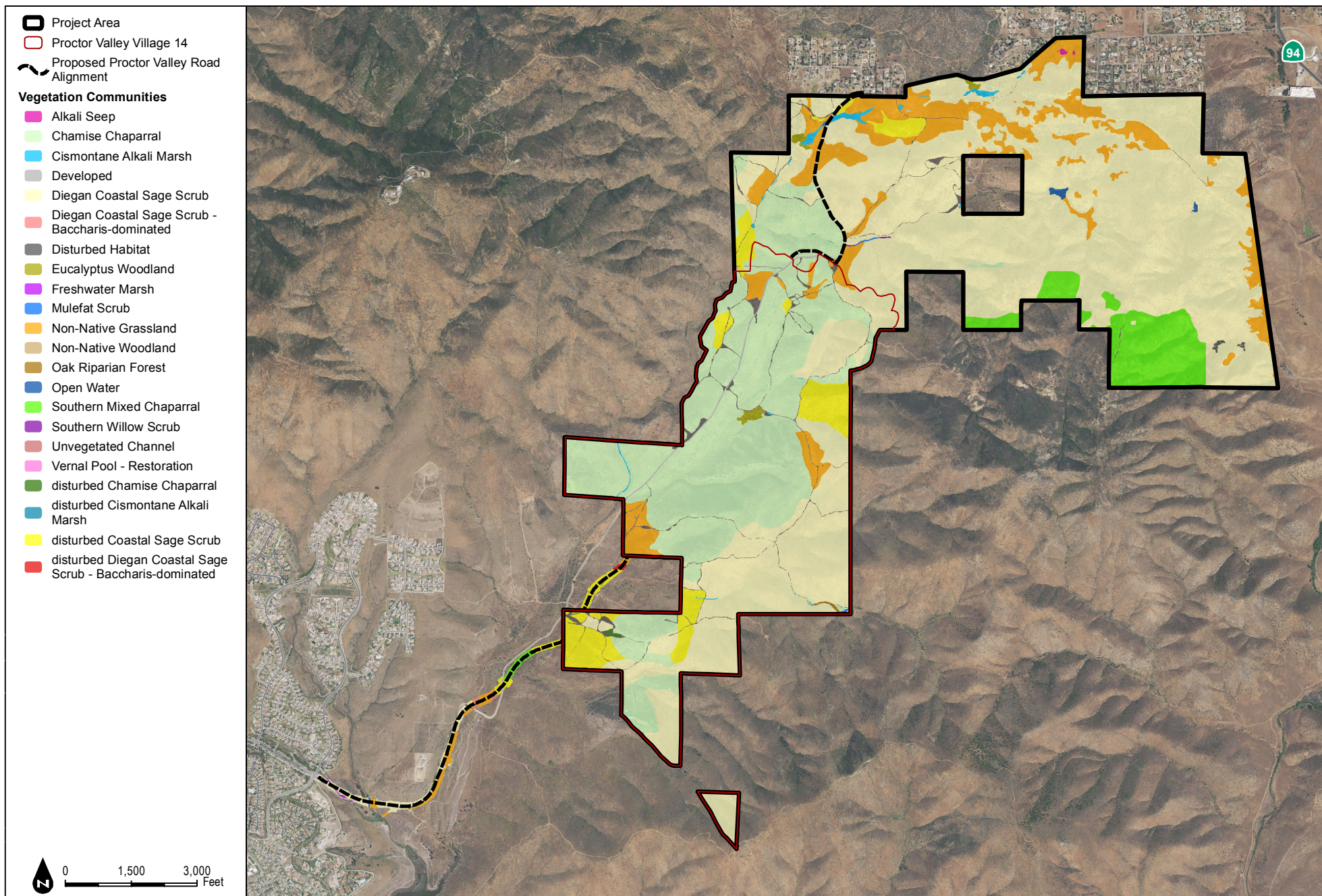
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the field and assigned fuel models for use during fire behavior modeling (see Section 4.1.1). These fuels are anticipated to remain in the areas adjacent to the development footprint (just outside the FMZs), but have been planned and compensated for through a system of fire protection described throughout this FPP.

2.2.4 Fuel Loads

The vegetation along the perimeter of the development and within approximately 300 feet of the fuel modification zones is the area of highest concern for determining what effects wildfire may have on the Land Exchange Alternative's landscape and structures. It is these fuels which if ignited, would burn up against the provided fuel modification zones and alternative protections, designed to reduce flame length, spread, and intensity as it gets closer to the built portions of the Land Exchange Alternative. Vegetation types in these areas have been classified into fuel models used for fire behavior modeling, discussed in Section 4 of this FPP (see Figure 4, Vegetation Map). The importance of vegetative cover on fire suppression efforts is its role in affecting fire behavior. For example, while fires burning in grasslands may exhibit lower flame lengths than those burning in chaparral fuels, fire spread rates in grasslands are often much more rapid than those in other vegetation types.

Fuel loading in non-native grassland is estimated to be 0.4 ton/acre, while that in chaparral-sage scrub is estimated between 8.4 – 8.6 tons/acre (Brown 1982; Scott and Burgan 2005; Weise and Regelbrugge 1997). The fuel load is the amount of fuel available to wildfire. Shrub dominated plant communities tend to include higher fuel loads than grass dominated plant communities. Tree dominated communities may include higher fuel loads than shrub dominated landscapes. However, there are many other facets of fire behavior that govern fire ignition and spread. Therefore, because an area may include higher fuel loads, it does not necessarily mean that it presents a higher fire risk.



SOURCE: NAIP 2016, Hunsaker 2017

DUDEK

Otay Ranch Village 14 and Planning Areas 16/19 - Land Exchange Alternative

FIGURE 4
Vegetation Map

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Land Exchange EIR Alternative
Fire Protection Plan**

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2.2.5 Vegetation Dynamics

Variations in vegetative cover type and species composition have a direct effect on fire behavior. Some plant communities and their associated plant species have increased flammability based on plant physiology (resin content), biological function (flowering, retention of dead plant material), physical structure (bark thickness, leaf size, branching patterns), and overall fuel loading. For example, the native shrub species that compose the chaparral communities in the Land Exchange Area are considered to be less likely to ignite, but would exhibit higher potential hazard (higher intensity heat and flame length) than grass dominated plant communities (fast moving, but lower intensity) if ignition occurred. The corresponding fuel models for each of these vegetation types are designed to capture these differences. Additionally, vegetative cover influences fire suppression efforts through its effect on fire behavior. For example, while fires burning in grasslands may exhibit lower flame lengths and heat outputs than those burning in native shrub habitats, fire spread rates in grasslands are often more rapid.

As previously described, vegetation plays a significant role in fire behavior, and is an important component to the fire behavior models discussed in this report. A critical factor to consider is the dynamic nature of vegetation communities. Fire presence and absence at varying cycles or regimes disrupts plant succession, setting plant communities to an earlier state where less fuel is present for a period of time as the plant community begins its succession again. In summary, high frequency fires tend to convert shrublands to grasslands or maintain grasslands, while fire exclusion tends to convert grasslands to shrublands, over time as shrubs sprout back or establish and are not disturbed by repeated fires. In general, biomass and associated fuel loading will increase over time, assuming that disturbance (fire, grazing) or fuel reduction efforts are not diligently implemented. It is possible to alter successional pathways for varying plant communities through manual alteration. This concept is a key component in the overall establishment and maintenance of the proposed FMZs. The FMZs will consist of irrigated and maintained landscapes as well as thinned native fuel zones that will be subject to regular “disturbance” in the form of maintenance and will not be allowed to accumulate excessive biomass over time, which results in reduced fire ignition, spread rates, and intensity.

Conditions adjacent to the Land Exchange Alternative’s footprint (outside the fuel modification zones), where the wildfire threat will exist post-development, are currently classified as low to moderate fuel loads due to the higher percentage of grasslands intermixed with sparse stands of chamise chaparral and coastal sage scrub fuels. However, climax vegetation state (undisturbed brush stands that are not disturbed for an extended period 50 years or more) includes more uniform and dense stands of sage scrub-chaparral fuels, which were employed for a conservative

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modeling approach to represent worst-case (i.e., max fuels) wildfire scenarios around the perimeter of the Land Exchange Alternative.

2.2.6 Fire History

Fire history is an important component of the site-specific FPP. Fire history data provides valuable information regarding fire spread, fire frequency, most vulnerable areas, and significant ignition sources, amongst others. In turn, this understanding of why fires occur in an area and how they typically spread can then be used for pre-planning and designing defensible communities. There have been 68 fires recorded by CAL FIRE since 1910 on their Fire and Resource Assessment Program (FRAP) database within 5 miles of the Land Exchange Alternative (FRAP 2014). 68 fires in this area over the last 105 years within 5 miles of the Land Exchange Alternative is not considered a high number for Southern California. On average, CAL FIRE annually responds to 5,000 wildfires over 10 acres (CAL FIRE 2015). In contrast to the 68 fires that burned within 5 miles of the Land Exchange Alternative, there have only been 17 fires that burned portions of the Land Exchange Alternative property. The most notable fire (Harris fire) occurred in October 2007, and burned approximately 90,440 acres in the southwestern portion of the County, including a large portion of the Land Exchange Area. SDCFA may have data regarding other smaller, undocumented fires that have occurred within the Land Exchange Area that have not been included herein because fires under 10 acres are not recorded by CAL FIRE. Appendix B, Fire History Exhibit, presents fire history within 5 miles of the Land Exchange Area and provides a graphical representation of the quantity of times the landscape has burned in the area. Recorded fires since 1910 that have burned onto the Land Exchange Area are listed in Table 2.

Table 2
Fire History in the Land Exchange Alternative Area

Fire Year ^a	Fire Name	Total Area Burned (acres)
1910	Un-named	9,218
1911	Un-named	32,308
1950	Wet Back	18,192
1968	Proctor	10,617
1970	Laguna	175,425
1980	Otay #6	13,059
1980	Proctor	9,996
1981	Proctor #1	2,523
1981	Proctor #2	413
1984	Proctor	11,604
1985	Miller	32,414

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Table 2
Fire History in the Land Exchange Alternative Area

Fire Year ^a	Fire Name	Total Area Burned (acres)
1989	Proctor #7	2,423
1999	Proctor	7,004
2003	Mine/Otay	46,291
2005	Proctor	204
2006	Proctor	54
2007	Harris	90,440

^a Based on polygon GIS data from CALFIRE's Fire and Resource Assessment Program (FRAP), which includes data from CAL FIRE, USDA Forest Service Region 5, BLM, NPS, Contract Counties and other agencies. The data set is a comprehensive fire perimeter GIS layer for public and private lands throughout the state and covers fires 10 acres and greater between 1878–2013.

Based on fire history data for the vicinity, fire return intervals range between 2 and 15 years, indicating significant wildfire potential in the region and the potential for the Land Exchange Area to be subject to occasional wildfire encroachment, most likely from the large expanses of open space to the north and east. Note that once the Land Exchange Alternative is built out, the fire spread patterns will be modified in this valley, as the Land Exchange Area will represent a large fuel break of maintained and irrigated landscapes, which fire may encroach upon and burn around, but will not burn through the valley with the same spread patterns as it has in the past. Although the Harris Fire burned through the Land Exchange Area in 2007, the homes in Rolling Hills Ranch, San Miguel Ranch, and built portions of Bella Lago to the southwest of the Land Exchange Area did not burn.

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3 DETERMINATION OF LAND EXCHANGE ALTERNATIVE EFFECTS

A Fire Protection Plan provides an evaluation of the adverse environmental effects a proposed project may have from wildland fire. The FPP must identify mitigation for identified impacts to ensure development does not unnecessarily expose people or structures to a significant loss, injury or death involving wildland fires. Significance is determined by answering the following guidelines:

Would the project expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildland are adjacent to urbanized areas or where residences are intermixed with wildland?

The wildland fire risk in the vicinity of the Land Exchange Area has been analyzed according to San Diego County Guidelines for Determining Significance – Wildland Fire and Fire Protection (2010). It has been determined that wildfires may occur in wildland areas that surround the Land Exchange Area, but would not be significantly increased in frequency, duration, or size with the construction of the Land Exchange Alternative. The Land Exchange Alternative would include conversion of fuels to maintained development with designated SDCFA review of landscaping and fuel modification areas and highly ignition resistant structures. As such, the development footprint will be largely converted from readily ignited fuels to ignition resistant landscape and structures that are provided defensible space consistent with State of California and County of San Diego standards, access for firefighters and early evacuations, water and fire flow to code, and other fire protection features, as described throughout this FPP.

Ignition Resistant Structures

The ignition resistant requirements for new communities built in high or very high fire hazard severity zones have been determined by State and Local Fire agencies to provide acceptable resistance to ignition from the types of wildland fires produced by the County's wildland fuels, terrain, and weather. San Diego County conducted after-fire assessments that strongly indicate that the building codes are working in preventing home loss. Of the 15,000 structures within the 2003 Cedar Fire perimeter, 17% (1,050) were damaged or destroyed. However, of the 400 structures built to the 2001 codes (the most recent at the time), only 4% (16) were damaged or destroyed. Further, of the 8,300 homes that were within the 2007 Witch Creek Fire perimeter, 17% were damaged or destroyed. Only 3% of the 789 homes that were built to 2001 codes were impacted and only 2% of the 1,218 structures built to the 2004 Codes were impacted (IBHS 2008). Many of the newer structures that were lost were due to human error. Similarly, of 194 structures lost or damaged in the Orange County Freeway Complex Fire (2008), there were no

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structures within the fire perimeter lost that were built to at least the 1996 special fire area codes (similar to the CBC Chapter 7A requirements) enacted by the City of Yorba Linda (OCFA 2008). Those codes required structure hardening against wildfire, but are less restrictive and result in less ignition resistant structures than current San Diego County Building and Fire Code requirements. Structures built to the 2016 Fire and Building Codes result in highly ignition and ember resistant structures. When combined with maintained fuel modification areas, fire apparatus access, water (fire flow), and an equipped and trained responding fire agency, the result is a defensible community.

Effective Fuel Modification Zones

Provisions for modified fuel areas separating wildland fuels from structures have also reduced the number of fuel-related structure losses by providing separation between structures and heat generated by wildland fuels. As such, most of the primary components of the layered fire protection system provided for the Land Exchange Alternative are required by SDCFA. However, they are worth listing because they have been proven effective for minimizing structural vulnerability to wildfire. In addition, interior fire sprinklers, which will be provided in all structures (now required by code), have a track record of extremely high reliability (Bukowski et al. no date) approaching 98% and statistics indicate that fires in homes with sprinklers resulted in 82% lower property damage and 68% lower loss of life (Hall Jr. 2013). Although not designed for wildland fire defense, should embers succeed in entering a structure, sprinklers provide an additional layer of life safety and structure protection.

Even though these measures are now required by the latest Building and Fire Codes, at one time, they were used as mitigation measures for buildings in WUI areas, because they were known to reduce structure vulnerability to wildfire. These measures performed so well, they were adopted into the 2007 California Building Code and have been retained and enhanced in code updates since then. The following features are required for new development in WUI areas and form the basis of the system of protection necessary to minimize structural ignitions as well as providing adequate access by emergency responders:

- Application of the latest adopted ignition resistant building codes
- Exterior wall coverings are to be non-combustible or ignition resistant
- Multi- pane glazing with a minimum of one tempered pane
- Ember resistant vents (recommend BrandGuard, O'Hagin, or similar vents)
- Interior, automatic fire sprinklers to code for occupancy type

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- Modern infrastructure, access roads, and water delivery system
- Maintained fuel modification areas
- Fire apparatus access roads throughout the Land Exchange Alternative

Ignition Sources

The types of potential ignition sources that currently exist in the area include overhead power lines, vehicles, roadways, and off-site residential neighborhoods. The Land Exchange Alternative would introduce potential ignition sources, particularly more people in the area. However, mitigating this increase in potential ignition sources, the Land Exchange Alternative would convert nearly 517 acres of ignitable fuels to lower flammability landscape and include better access throughout the development footprint, managed and maintained landscapes, and more eyes and ears on the ground to reduce the likelihood of arson, off-road vehicles, or shooting related fires. In addition, the Land Exchange Alternative will include a fire station, apparatus and staffing that will be able to respond quickly to reported fires.

The provided FMZs are designed to not only minimize wildfire encroaching upon the community, but to minimize the likelihood that an ignition from developed areas spread into the Otay Ranch RMP/MSCP Preserve by separating the unmaintained vegetation occurring outside the FMZs with that in the FMZs. Vegetation within the FMZs, which will be maintained and the first 50 feet irrigated, resulting in high fuel moisture, which is difficult to ignite (USFS-WFAS 2015), reduced fuel densities, lack of fuel continuity, and a reduction in the receptiveness of the landscape to ignition and fire spread. Fires from off-site would not have continuous fuels across the development footprint and would therefore be expected to burn around and/or over the developed landscape via spotting. Burning vegetation embers may land on Land Exchange Alternative structures, but are not likely to result in ignition based on ember decay rates and the types of non-combustible and ignition resistant materials and venting that will be used within the Land Exchange Alternative and the ongoing inspections and maintenance that will occur in the Land Exchange Alternative's landscaped areas and FMZs.

The Land Exchange Alternative would comply with the applicable fire and building codes and would include a layered fire protection system designed to current codes and inclusive of site-specific measures that will result in a Land Exchange Alternative that is less susceptible to wildfire than surrounding landscapes and that would facilitate fire fighter and medical aid response. These features combined with the ignition resistance construction required result in consistency with San Diego County Guidelines and a resulting acceptable fire hazard risk.

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Would the project result in inadequate emergency access?

The Land Exchange Alternative would not result in inadequate emergency access. The proposed internal looped roadways meet County standards and provide emergency access over the roadways that include a minimum of 24 feet (two 12-foot-wide, unobstructed travel lanes) and room for parking. Additionally, the roads would provide residents the option to evacuate from at least two egress access points in two different directions from each neighborhood. Depending on the nature of the emergency, residents can exit to the north/northeast or to the south on Proctor Valley Road. In emergencies where it is safer to remain within developed portions of the Land Exchange Area, temporary refuge would be possible as a last resort, if evacuation was considered unsafe, given the large area of developed landscape that will result from the Land Exchange Alternative's construction. The internal roadways from the residences to Proctor Valley Road will be provided fuel modified passageways. Portions of Proctor Valley Road to the north and south of the Land Exchange Alternative's developed areas would traverse through areas with natural vegetation (consistent with current fuels). The Land Exchange Alternative will provide a minimum of 20 feet of modified fuel areas along both sides of internal roads to provide a buffer that will act to reduce ignitions from vehicle related causes and provide set back from wildland fuels. Evacuation would be focused on early evacuations, long before fire was in the area, following the "Ready, Set, Go!" model, or else contingency options that would be available to this Land Exchange Alternative may be determined to be safer than evacuating by responding fire and law enforcement personnel. An evacuation plan will be prepared for the Land Exchange Alternative and provided to the residents so that all residents are aware of the evacuation routes, of the fluidity of wildfire events, and of the options that may be presented to them by responding law enforcement and/or fire personnel, Reverse 911, or other officials. An annual evacuation awareness program will be conducted as well as on-line access to fire awareness educational material on the Communities' Website.

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance service ratios, response times or other performance objectives for fire protection?

The Land Exchange Alternative is projected by Dudek's call volume analysis (utilizing San Diego County per capita call generation factor of 82 calls per 1,000 persons) to add approximately 459 calls per year to the SDCFA's existing call load. This is not enough of an increase to require additional resources. However, in order to meet the County's General Plan 5 emergency minute travel time standard, the Land Exchange Alternative will require the provision of a new fire station

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within the Land Exchange Area. With the new fire station, SDCFA has indicated it can and will serve the Land Exchange Alternative (Appendix C, Fire Service Availability Form). This fire station would be a residential fire station with 2 engine bays meeting SDCFA's current configuration standards for this type of facility and the Land Exchange Alternative would provide a fire engine (Type I or II) to SDCFA's specifications. Staffing would include 2 career firefighter positions and one reserve until a threshold is reached where a 3rd career position can be financed and the reserve firefighter position would continue for a 4.0 staffing.

Interim fire protection during construction would be provided by Station 36 or possibly by a temporary station. The permanent fire station was planned for this area in the approved 1993 Otay Ranch GDP/SRP and impacts associated with the construction and operation of the fire station have been analyzed as part of the Land Exchange Alternative's EIR and found to be less than significant after mitigations. Primary response (first in) would be provided by the new fire station. That station would be able to provide first engine response to all portions of the Land Exchange Alternative within 5 minutes travel. The next closest SDCFA station is Station 36, located at 14024 Peaceful Valley Ranch Road, approximately 5 miles from the midpoint of the Land Exchange Alternative along Proctor Valley Road. Station 36 averages roughly one call per day within its response area. The Land Exchange Alternative will provide funding for constructing, equipping, operating and maintaining the new fire station on the site. The station will be housed in the proposed public safety facility in the Village Core, which is located in Central Village 14.

Would the project have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

The Land Exchange Alternative will be served by Otay Water District (OWD) and sufficient water supplies will be available to serve the Land Exchange Alternative from existing entitlements and resources. SDCFA, and the OWD require new development to meet a minimum 2500 gallons per minute (gpm) fire flow. The OWD has provided a water availability/will serve form to the Land Exchange Alternative (Appendix D, Water Service Availability Form).

The measures described in the responses to these significance questions are provided in more detail in the following sections.

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4 ANTICIPATED FIRE BEHAVIOR

4.1 Fire Behavior Modeling

Following field data collection efforts and available data analysis, fire behavior modeling was conducted to document the type and intensity of fire that would be expected adjacent to the Land Exchange Alternative development footprint given characteristic site features such as topography, vegetation, and weather. The BehavePlus 5.0.5. fire behavior modeling software package, the latest version of the industry standard fire behavior prediction software, was utilized in evaluating anticipated fire behavior adjacent to proposed fuel modification zones for the perimeter of the Land Exchange Alternative’s developed areas. Results are provided below and a more detailed presentation of the BehavePlus modeling and analysis, including fuel moisture and weather input variables, is provided in Appendix E, Fire Behavior Modeling Input Data.

4.1.1 BehavePlus Fire Behavior Modeling Effort

Fire Behavior results derived from the BehavePlus modeling efforts are presented in Table 3 and in Figure 5, Fire Behavior Modeling. Four focused analyses (fire scenarios) were completed, each assuming worst-case fire weather conditions for a fire approaching the Land Exchange Alternative site primarily from the northeast or southwest. These fire scenario areas, which were directly adjacent to the fuel modification zones and around the perimeter of the Land Exchange Alternative development footprint, were modeled as a short grass (Fuel Model 1), a chamise chaparral (Fuel Model Sh5), or a coastal sage scrub (Fuel Model SCAL 18) fuelbeds. This detailed analysis compared fire behavior adjacent to the proposed development with outputs including flame length (feet), rate of spread (mph), and fireline intensity (BTU per foot per second).

Table 3
BehavePlus Fire Behavior Modeling Results

Scenario	Fuel Model	50th Percentile Weather (On-Shore Wind Conditions)			97th Percentile Weather (Off-Shore Peak Wind Conditions)			Spotting Distance (miles)
		Flame Length (feet)	Fireline Intensity (Btu/ft/s)	Rate of Spread (mph)	Flame Length (feet)	Fireline Intensity (Btu/ft/s)	Rate of Spread (mph)	
1	1,Sh5,SCAL 18	10.7	984	0.42	—	—	—	0.3
2	Sh5, SCAL 18	—	—	—	34.2	12,229	4.4	2.0
3	Sh5, SCAL 18	—	—	—	34.4	12,386	4.4	2.0
4	Sh5, SCAL 18	9.2	706	0.21	—	—	—	0.2

Btu/ft/s = British thermal units per foot per second; mph = miles per hour

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Based on the results of BehavePlus analysis, worst-case fire behavior is expected in sage scrub-chaparral fuels along the northern and eastern edges of the proposed development during a strong (Santa Ana) wind-driven fire event (Scenarios 2 and 3). Under such extreme weather conditions, flame lengths in the sage scrub-grassland fuelbed will approach 34.4 feet with fire spread rates reaching approximately 4.4 mph due to high winds and very low fuel moistures.

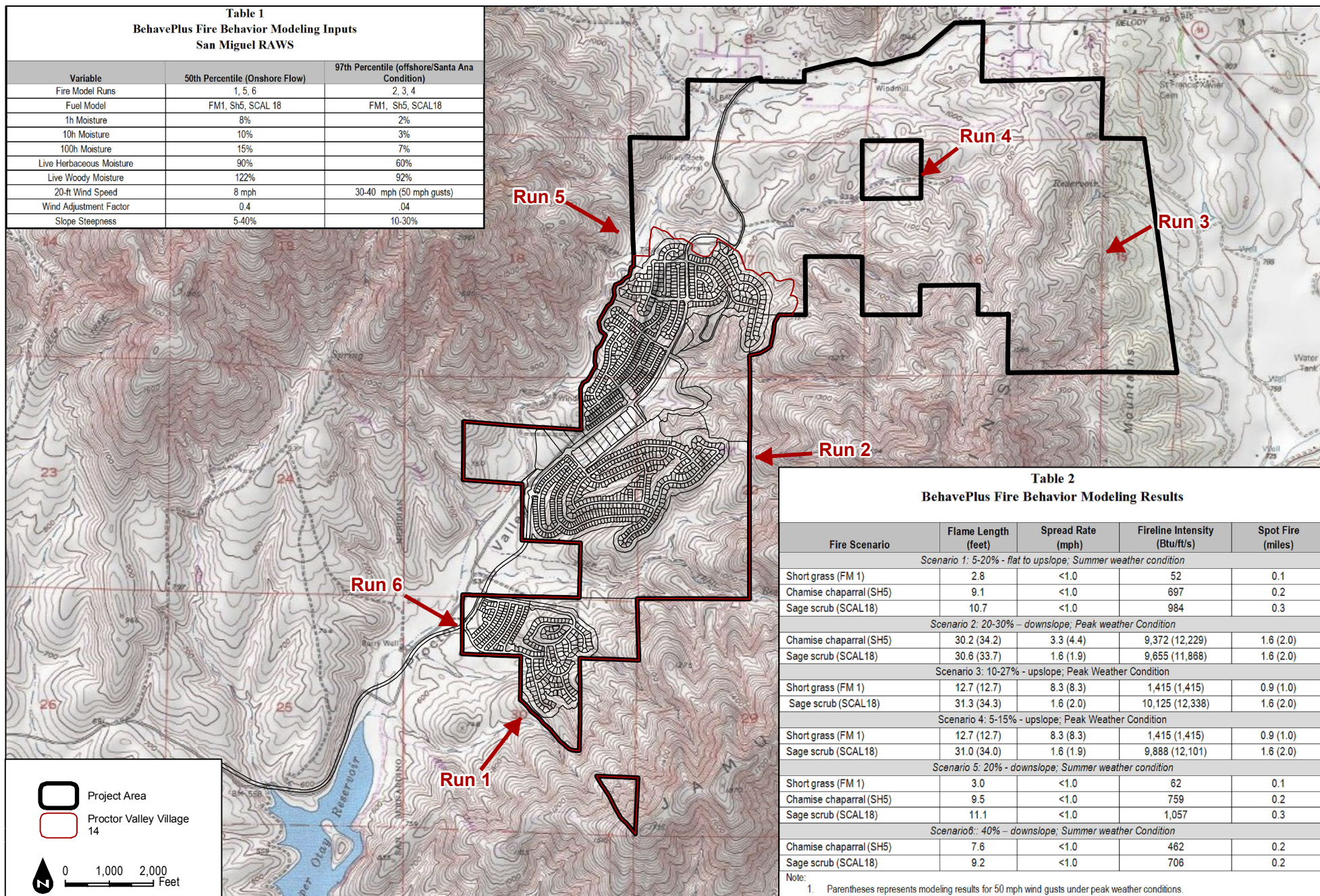
On the contrary, wildfires occurring during on-shore wind patterns are expected to be of low to moderate severity with flames lengths of 11 feet and slower spread rates (less than 1.0 mph) due to higher fuel moisture content and reduced wind speeds. Sage scrub fuel types can burn intensely and can produce a fast-spreading wildland fire under strong, dry wind patterns. This fuel type can produce higher heat intensity and higher flame lengths under strong, dry wind patterns, but does not typically ignite or spread as quickly as light, flashy grass fuels.

The results presented in Table 3 depict values based on inputs to the BehavePlus software and are not intended to capture changing fire behavior as it moves across a landscape. Changes in slope, weather, or pockets of different fuel types are not accounted for in this analysis. For planning purposes, the averaged worst-case fire behavior is the most useful information for conservative fuel modification design. Model results should be used as a basis for planning only, as actual fire behavior for a given location will be affected by many factors, including unique weather patterns, small-scale topographic variations, or changing vegetation patterns. As such, the proposed 100-foot FMZ width will be approximately 2.5 times wider than the calculated flame lengths.

4.2 Fire Behavior Summary

Given the history of wildfire in the vicinity of the Land Exchange Area, including the 2007 Harris Fire which burned through the Land Exchange Area, combined with topography, vegetation, climate, nearby ignition sources, and anticipated fire behavior, the Land Exchange Area, in its current condition, is considered to be vulnerable to wildfire ignition and spread during extreme fire weather. Wildfires may start on, burn onto, or spot into the Otay Ranch RMP/MSCP Preserve. The most common type of fire anticipated in the vicinity of the Land Exchange Area is a wind-driven fire from the north/northeast, moving downslope or northeast to southwest through Proctor Valley through the chamise- chaparral and sage scrub shrubs found on the foothills of the Jamul Mountains that will remain in place post-development.

The post-construction condition of this landscape (Development Footprint) will modify the ability of fire to spread in Proctor Valley. The Land Exchange Alternative's landscaped and irrigated areas and FMZs, as well as the paved roadways and ignition resistant structures will result in reduced fire intensity and spread rates around the Land Exchange Alternative, creating defensible space for firefighters. The result will be improved fire safety of Land Exchange Alternative Area with regard to fire behavior, including potentially for adjacent, down-wind communities.



SOURCE: Hunsaker 2017

DUDEK

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FIGURE 5
Fire Behavior Modeling

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5 EMERGENCY RESPONSE AND SERVICE

5.1 Existing Fire Department Response Capabilities

The Land Exchange Alternative is located within the SDCFA responsibility area. The SDCFA has identified strategic response resource positioning at the Land Exchange Alternative's proposed fire station that will provide efficient coverage for the Land Exchange Area.

The City of Chula Vista provides fire service to areas west/southwest of the Land Exchange Area and has a fire station located approximately 4 miles from the Land Exchange Area. Chula Vista Fire Department has not been considered for providing fire protection services for the Land Exchange Alternative for two primary reasons: (1) the Land Exchange Alternative is within SDCFA jurisdictional area, an agency that has indicated it can and will serve the Land Exchange Alternative, and (2) there are no existing or planned Chula Vista Fire Stations that can meet the County's 5 minute General Plan travel time standard for any portion of the Land Exchange Alternative.

The addition of SDCFA emergency response resources within the Land Exchange Alternative will provide enhanced coverage to this portion of the SDCFA's response area and is considered to also benefit the City of Chula Vista Fire Department in its eastern City areas based on existing automatic aid agreements.

Based on current resources, there are up to three staffed fire stations with three fire agencies in the area. The SDCFA is a combination fire agency that uses both paid and reserve firefighters. Initial response to the Land Exchange Alternative would be either from Station 36 or from a temporary station located within the development footprint. Interim response would be determined in a fire service agreement between the Land Exchange Alternative and SDCFA, and would be in place prior to approval of the Land Exchange Alternative. Station 36 at 14024 Peaceful Valley Road in Jamul is approximately 3 road miles from the Land Exchange Alternative's northern entrance. Station 36 has three full-time firefighters and the following apparatus:

- One structural fire engines
- One rescue squad truck
- One brush fire engine
- One Battalion Chief
- One ladder truck
- One light and air unit

Fire Station 36 currently responds to about 1.0 call per day (2012 statistics). Because Station 36 cannot meet the General Plan's 5 minute travel time standard, the applicant will be required and has agreed to build a station within the Land Exchange Alternative Area.

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Vegetation fires require special apparatus and depending on weather and fuel conditions, may require a significant response. SDCFA will be able to call on the Land Exchange Alternative Station resources as well as the full CAL FIRE response weight:

Fire Station:

- Type 1 or Type II engine

Full CAL FIRE response:

- Five to 10 Type III engines (depending on dispatch level)
- Battalion Chief
- Three fixed wing aircraft (two tankers and air attack)
- Dozer
- Two hand crews
- Two helicopters

Although out of the direct protection area, the neighboring fire agency, City of Chula Vista Fire Department, includes resources that may be available to respond to emergency calls as second or third engine via the existing or an updated automatic or mutual aid agreement. Of the existing fire stations in the vicinity of the Land Exchange Alternative, Chula Vista's Fire Station 8 is the closest. Chula Vista Fire Station No. 8 is located at the intersection of Otay Lakes Road and Woods Drive, approximately 2.9 miles from the southern-most entrance to the Land Exchange Area. It houses a staffed engine company. However, this location does not serve the majority of the Land Exchange Alternative within a 5 minute travel time.

Currently, the closest ladder truck is housed at Station 36 in Jamul, approximately 2.5 to 6 road miles (depending on which part of the Land Exchange Area is calculated) east of the Land Exchange Alternative's developed areas.

5.2 Estimated Calls and Demand for Service from the Land Exchange Alternative

As indicated in Table 4, using San Diego County Fire Agencies' estimate of 82 annual calls per 1,000 population, the Land Exchange Alternative's conservatively estimated 5,504 permanent residents, and 94 staff associated within the mixed use site, would generate approximately 459 calls per year (1.3 calls per day). Of these calls, at least 70% are expected to be medical

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emergencies and 2.3% fire related calls, based on typical call volumes (personal experience of author working in San Diego County fire jurisdictions).

Table 4
Calculated Call Volume Associated with the Proctor Valley Village

Emergency Calls per 1,000	Number of Residents, Guests, and Staff*	Avg. No. Calls per Year (5,598/1,000)x82	Avg. No. Calls per Day (377/365)
82	5,598 (estimate)	459	1.26

* Population estimates based on 3.6 persons per residential dwelling unit for all occupancy types.

NOTE: the senior housing planned for the Land Exchange Alternative may generate higher call volumes than the other development areas. However, the number of seniors is not substantial enough to require a separate calculation. The per capita call volume number considers all population demographics, including seniors and high call generating urban areas, and is therefore considered conservative and appropriate for this Land Exchange Alternative and its anticipated demographic.

5.3 Fire Response Modeling

The San Diego County General Plan Safety Element includes Travel Time Standards from the “Closest Fire Station” (San Diego County General Plan Update 2011). Travel time does not represent total response time, which is calculated by adding the travel time to the call processing time and to the turnout/reflex time. Generally, the call processing and turnout/reflex time would add between 2 to 3 minutes to the travel time. Table 5, taken from the County General Plan’s Table S-1, establishes a service level standard, not a requirement, for fire and first responder emergency medical services that is appropriate to the area where a development is located. Standards are intended to help ensure development occurs in areas with adequate fire protection and/or help improve fire service in areas with inadequate coverage by requiring mitigation for service-level improvements as part of Land Exchange Alternative approval.

Table 5
Travel Time Standards from the Closest Fire Station*

Travel Time	Regional Category (and/or Land Use Designation)	Rationale for Travel Time Standards**
5 min	<ul style="list-style-type: none"> Village (VR-2 to VR-30) and limited Semi-Rural Residential Areas (SR-1) Commercial and Industrial Designations in the Village Regional Category Development located within a Village Boundary 	In general, this travel time standard applies to the County’s more intensely developed areas, where resident and business expectations for service are the highest.
10 min	<ul style="list-style-type: none"> Semi-Rural Residential Areas (> SR-1 and SR-2 and SR-4) Commercial and Industrial Designations in the Semi-Rural Regional Category Development located within a Rural Village Boundary 	In general, this travel time provides a moderate level of service in areas where lower-density development, longer access routes and longer distances make it difficult to achieve shorter travel times.

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Table 5
Travel Time Standards from the Closest Fire Station*

Travel Time	Regional Category (and/or Land Use Designation)	Rationale for Travel Time Standards**
20 min	Limited Semi-Rural Residential areas (>SR-4, SR-10) and Rural Lands (RL-20) All Commercial and Industrial Designations in the Rural Lands Regional Category	In general, this travel time is appropriate for very low density residential areas, where full-time fire service is limited and where long access routes make it impossible to achieve shorter travel times.
>20 min	Very-low rural land densities (RL-40 and RL-80)	Application of very-low rural densities mitigates the risk associated with wildfires by drastically reducing the number of people potentially exposed to this hazard. Future subdivisions at these densities are not required to meet a travel time standard. However, independent fire districts should impose additional mitigation requirements on development in these areas.

* The most restrictive standard will apply when the density, regional category and/or village/rural village boundary do not yield a consistent response time standard.

** Travel time standards do not guarantee a specific level of service or response time from fire and emergency services. Level of service is determined by the funding and resources available to the responding entity.

The Land Exchange Alternative would be subject to the San Diego County General Plan 5-minute travel time standard post development based on its parcel sizes and Land Exchange Alternative proposed residential densities.

The closest existing SDCFA station, Station 36 in Jamul at the intersection of Peaceful Valley Road and Campo Road, is beyond the 5-minute travel time response, varying from just over 5 minutes for the northerly areas up to roughly 11 minutes travel for the most southerly development areas. These travel times are similar to the existing Chula Vista Fire Stations Nos. 6 and 8. To understand fire department response capabilities, Dudek conducted an analysis of the travel time response coverage from the closest, existing stations as well as the proposed Land Exchange Alternative Public Safety Site (fire station). This modeling analysis was conducted using Network Analyst tools within GIS software, road data files, and Land Exchange Alternative development plan data. Response travel speed for this analysis was held constant at 35 mph, consistent with the Insurance Services Office (ISO) Public Protection Classification Program's Response Time Standard, and incorporated impedances (slowdowns) for intersections and turns by the model. This average speed has been validated for ISO as still being applicable as a predictive tool and considers average terrain, average traffic, weather, and slowing down for intersections. While the circulation systems include certain traffic calming tools to improve pedestrian safety, a 35 mph response travel speed is considered appropriate because the proposed street cross sections comply with fire access travel width requirements. Model output files were

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utilized to analyze the quantity and percentage of individual Land Exchange Alternative units that could be reached by fire response personnel from each site, assuming travel time and speed constraints. Modeling data and results are presented in Appendices F1 through F4, Fire Department Response Analysis. Table 6 presents the results of the emergency response analysis.

Table 6
Emergency Travel Times from Proposed Public Safety Site and
SDCFA and Chula Vista Closest Station Sites

5 Minute Travel Time	Quantity of Units Reached within 5 Minutes	Percentage of Residential Units Reached within 5 Minutes	Quantity of Units Reached within 10 Minutes	Percentage of Residential Units Reached within 10 Minutes
Public Safety Site	1,530	100%	N/A	N/A
CVFD Station 6	0	0%	1,475	96.5%
CVFD Station 8	0	0%	1,530	100%
SDCFA Station 36	0	0%	1,371	89.7%

* The travel time analysis has considered proposed traffic calming measures proposed for the Land Exchange Alternative. The types of traffic calming proposed maintain the emergency travel speeds modeled for this analysis.

Once the network data set parameters were finalized, Dudek ran network models to depict the response coverage from the permanent public safety site. The model results in Appendices F1 through F4 depict the geographic limits that can be reached within 5 minutes travel time intervals. As indicated in Table 6 and Appendix F4, the entire community falls within the 5-minute travel time standard from the identified Public Safety Site. Additional response, as needed, can potentially be provided by the other modeled existing fire stations. Based on this information, the Land Exchange Alternative meets the County's travel time standard and the SDCFA can provide significant resources to emergency calls within the Land Exchange Alternative.

Response Capability Impact Assessment and Mitigation

The Land Exchange Alternative includes a significant number of new homes, a school site, and commercial structures. Service level requirements could, in the absence of fire facilities and resources improvements, cause a decline in the SDCFA response times and capabilities. The requirements described in this FPP are intended to aid fire-fighting personnel and minimize the demand placed on the existing emergency service system. However, additional firefighting capabilities and resources will be required to meet the demands created by the Land Exchange Alternative.

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To avoid potential degradation of services, meet the anticipated increased demand in accordance with County emergency travel times, and respond to the risks, the Land Exchange Alternative will be required to provide additional firefighting and emergency medical response capabilities. General additional resources required to serve the Land Exchange Alternative are outlined in Section 5.4 of this FPP.

5.4 Land Exchange Alternative Fire and Emergency Services

The following summary provides information pertaining to fire and emergency service response configuration for the Land Exchange Alternative. Final fire and emergency services may include implementation of an optional configuration, as discussed below.

Land Exchange Alternative Fire and Emergency Response Configuration

The Land Exchange Area is within the County of San Diego. The San Diego County General Plan includes travel time standards of 5-minutes, 10-minutes, 20-minutes and over 20-minutes, depending on the Land Use and Regional Category designations. The Land Exchange Alternative site is designated semi-rural on the Jamul/Dulzura Subregional Planning Area Map, which falls under both the 5-minute and 10-minute response standard. Table S-1 of the County General Plan Safety Element describes in situations where the density, regional category and/or village/rural village boundary do not yield a consistent response time standard the more restrictive standard shall apply; thus, the proposed fire and emergency response configuration is based on what would be required to achieve the 5-minute travel time standard.

To ensure the entire Land Exchange Area could be served within a 5-minute travel time, the public safety site would be centrally located within the Village Core. Not only does this provide for better response coverage, but the location across from the neighborhood Village Green park, mixed-use Village Square, and elementary school site and close to the age-restricted residential neighborhoods ensure the public safety site will be a civic presence and located near the highest anticipated potential call generating land uses. Timing of construction of a temporary station (if the permanent station is not constructed at the commencement of construction) and a permanent fire station within the Village 14 will be finalized and documented in a “Fire Services Agreement” between the applicant and the SDCFA. The temporary fire station, if necessary, would be available and located with SDCFA guidance so that it is available during vertical construction and for a specified period. Construction of the permanent fire station would be on the Public Safety site identified in the Specific Plan and Tentative Map at an agreed upon trigger threshold, that will be detailed in the Fire Services Agreement.

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The Land Exchange Alternative will provide its fair share funding for staffing and equipping the new station sized to serve the calls generated by the Land Exchange Alternative. The type and size of the permanent fire station will be based on the projected call volume, and the anticipated apparatus and staffing. The fire station will include an advanced life support (ALS), Schedule A engine company funded by the Land Exchange Alternative. The station would be equipped with a Type II interface fire engine that is suited to respond to structure fires or vegetation fires. Staffing is expected to include an interim period where two career firefighter positions and one reserve position are provided until a unit count or similar threshold is reached, at which time, staffing would include three career positions and one reserve. Depending on the number of emergency medical calls generated by the Land Exchange Alternative, the ambulance provider may elect to move a unit to the site, but that will be an independent decision for the ambulance provider. A Fire Service Agreement will be prepared and approved by the applicant and the SDCFA prior to approval of the Land Exchange Alternative.

In addition to the ALS Schedule A engine company provided by the Land Exchange Alternative, SDCFA has a Type I Engine and a ladder truck company located at the existing Jamul Fire Station No. 36 (roughly 5.5 miles from the Land Exchange Area). This is a 4 person, ALS Truck Company that will be available to respond to the Land Exchange Area, as needed.

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6 FIRE SAFETY REQUIREMENTS: DEFENSIBLE SPACE, INFRASTRUCTURE, AND BUILDING IGNITION RESISTANCE

6.1 Fuel Modification Zones

6.1.1 Zones and Permitted Vegetation

As indicated in preceding sections of this FPP, an important component of a fire protection system is the fuel modification zone (FMZ). FMZs are designed to gradually reduce fire intensity and flame lengths from advancing fire by strategically placing thinning zones, restricted vegetation zones, and irrigated zones adjacent to each other on the perimeter of the community's WUI exposed structures, as well as around all structures including:

- All residential and commercial occupancies;
- School;
- Public Safety Site;
- Open space areas within the development footprint; and
- Emergency Access Roads or Streets

Based on the modeled extreme weather flame lengths for the Land Exchange Alternative, average wildfire flame lengths are projected to be approximately 34 feet high. The fire behavior modeling system used to predict these flame lengths was not intended to determine sufficient FMZ widths, but it does provide the average predicted length of the flames, which is a key element for determining “defensible space” distances for providing fire fighters with room to work and minimizing structure ignition. For this Land Exchange Alternative, the FMZ width outside the lot line is 100 feet, ranging from 2 ½ to 10 times the modeled flame lengths based on the fuel type represented adjacent to the site. There are two exception areas to the 100 feet wide FMZ areas, as discussed in detail in Section 6.1.1.2.

The following FMZ requirements are proposed for this Land Exchange Alternative. In addition to the fuel modification zones meeting defensible space requirements, the entire landscape will be restricted to lower flammability landscaping as part of a fire adapted community approach. The fuel modification zones and landscape areas are presented graphically in Appendix G, Fuel Modification Zone Exhibit. In addition, the proposed fire adapted plant palette is provided in Appendix H, Land Exchange Alternative Plant Palette.

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Fuel Modification Zone Definition

Fuel modification zones are designed to provide buffers at perimeter areas of projects to reduce fuel available to wildfire. These zones reduce fire spread rates and fire intensity by providing thinned fuels in the outer zones and irrigated, selective plantings in the inner zones. FMZs are typically 100 feet wide. The total width of the FMZs for the Land Exchange Alternative will be 120 feet, with the rear yard, which average 20 feet, included as part of the FMZ. Therefore, a typical landscape/fuel modification installation for the perimeter lots exceeds the 100 foot standard, consisting of up to 120-foot wide fuel management area from the structure extending outwards toward Otay Ranch RMP/MSCP Preserve areas.

Research has indicated that the closer a fire is to a structure, the higher the level of heat exposure (Cohen 2000). However, studies indicate that given certain assumptions (e.g., 10 meters of low fuel landscape, no open windows), wildfire does not spread to homes unless the fuel and heat requirements (of the home) are sufficient for ignition and continued combustion (Cohen 1995, Alexander et al. 1998). Construction materials and methods can prevent or minimize ignitions. Similar case studies indicate that with nonflammable roofs and vegetation modification from 10–18 meters (roughly 32–60 feet) in southern California fires, 85–95% of the homes survived (Howard et al. 1973, Foote and Gilless 1996).

These results support Cohen's (2000) findings that if a community's homes have a sufficiently low home ignitability (i.e., 2017 San Diego County Consolidated Code and 2016 California Building Code), the community can survive exposure to wildfire without major fire destruction. This provides the option of mitigating the wildland fire threat to homes/structures at the residential location without excessive wildland fuel reduction and focusing the effort in the area's nearest the structures. Cohen's (1995) studies suggest, as a rule-of-thumb, larger flame lengths and widths require wider fuel modification zones to reduce structure ignition. For example, valid SIAM results indicate that a 20-foot high flame has minimal radiant heat to ignite a structure (bare wood) beyond 33 feet (horizontal distance). Whereas, a 70-foot high flame may require about 130 feet of clearance to prevent structure ignitions from radiant heat (Cohen and Butler 1996). This study utilized bare wood, which is more combustible than the ignition resistant exterior walls for structures built today.

Obstacles, including steep terrain and non-combustible walls can block or deflect all or part of the radiation and heat, thus making narrower fuel modification distances possible. Fire behavior modeling conducted for this alternative indicates that fires in the off-site areas would result in roughly 33-foot flame lengths under summer conditions. Extreme conditions may result in longer flame lengths, approaching 67 feet.

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As indicated in this report, the FMZs, which are adjacent to all structures and outside of the Otay Ranch RMP/MSCP Preserve areas, and additional fire protection measures proposed for the Land Exchange Alternative provide a wildfire buffer, and exceed the standard 100 foot wide, two zone standard. The zones are based on a variety of analysis criteria including predicted flame length, fire intensity (Btu), site topography and vegetation, extreme and typical weather, position of structures on pads, position of roadways, adjacent fuels, fire history, current vs. proposed land use, neighboring communities relative to the Land Exchange Alternative, and type of construction. The fire intensity research conducted by Cohen (1995), Cohen and Butler (1996), and Cohen and Saveland (1997) and Tran et al. (1992) supports the fuel modification proposed for this alternative.

General Criteria

- All plant material listed on the “Fire Protection Plan” prohibited plant list (Appendix I, Prohibited Plant List) will be prohibited within any Fuel Modification Zone.
- 50%–70% of the overall fuel modification areas shall be planted with deep rooting plant material.
- Debris and trimmings produced by thinning and pruning shall be removed from the site, except for larger woody debris that may be chipped and left for weed and erosion control.
- There shall be no hedging of shrubs so that they do not form a means of rapidly transmitting fire from the native growth to the structures.
- Shrubs may be planted in clusters not exceeding a total of 400 square feet.
- A distance of no less than the width of the largest shrub’s mature spread shall be provided between each shrub cluster.
- Non-shrub avenues devoid of shrubs shall be included to provide a clear access route from toe of slope to top of slope and shall be a minimum width of 6 feet and spaced a distance of 200 linear feet on center.
- Where shrubs or other plants are planted underneath trees, the mature tree canopy shall be maintained at a height no less than three times the shrub or other plant’s mature height to break up any fire laddering² effect.

² Plant material that can carry a fire burning in low-growing vegetation to taller vegetation is called ladder fuel. Examples of ladder fuels include low-lying tree branches and shrubs, climbing vines, and tree-form shrubs underneath the canopy of a large tree.

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Zone 1A – Setback Zone

Zone 1A – Definition

Zone 1A is the first 20 feet (rear yard) from the structure to the lot line. This area will be included in the overall site reduced fuel zones. Homeowners will be responsible for ensuring that rear-yard landscaping is compliant with this FPP. The Land Exchange Alternative's HOA will include a landscape committee to review and approve landscape plans and provide ongoing education to homeowners regarding fire adapted landscape maintenance.

Zone 1

Zone 1 – Definition

All public and private areas located between the lot line and 50 feet outward. These areas may be located on public slopes, private open-space lots, public streets, and/or private yards, as defined in the landscape fuel modification exhibit.

Some perimeter lots receive extended Zone 1 FMZs on the manufactured slope or internal Firesafe common area landscaping. These 100 foot wide FMZs exceed the code requirement by providing low fuel densities and irrigated fuels for the entire 100 feet versus 50 feet of irrigated and 50 feet of thinned area.

Zone 1 – Specific Criteria

- This irrigated high plant moisture zone shall be serviced by a permanent automatic irrigation system that keeps plants hydrated via efficient drip irrigation
- No tree limb encroachment within 10 feet of a structure or chimney, including outside barbecues or fireplaces.
- Minimum 10 feet between tree canopies.
- Tree maintenance includes limbing-up (canopy raising) 6 feet or one-third the height of a mature tree.
- Additional trees (excluding prohibited or highly flammable species) may be planted as parkway trees on single loaded streets.
- 75% of all groundcover and sprawling vine masses shall be limited to a maximum height of 18 inches.
- 25% of all groundcover and sprawling vine masses may reach a maximum height of 24 inches.

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- Ground covers must be of high-leaf moisture content.
- Shrubs shall be less than 2 feet tall, on 5-foot centers.
- Randomly place approved succulent type plant material may exceed the height requirements, provided that they are spaced in groups of no more than 3 and a minimum of 5 feet away from described “clear access routes.”
- Vegetation/Landscape Plans shall be in compliance with this FPP.

Zone 2

Zone 2 – Definition

All public and private areas located between the outside edge of Zone 1 and 50 feet outward. These areas may be located on public slopes, private open-space lots, public streets, and/or private yards, as defined in the landscape fuel modification exhibit.

Zone 2 – Specific Criteria

- Represents a 50% thinning zone – 50% less fuel than on adjacent unmaintained Otay Ranch RMP/MSCP Preserve areas. Zone 2 areas will include removal of dead/dying vegetation, exotics, and plant species listed on the prohibited plant list. Removal of these components will result in 50% thinning of the existing fuels. As necessary to meet the 50% thinning objective, other plants will be removed to create a mosaic of vegetation with adequate spacing and discontinuity.
- All manufactured slopes within this area shall be serviced by a temporary, aboveground automatic irrigation system which will be turned off once the plantings are established, but will remain in place.
- Trees may be located within this zone, provided that they are planted in clusters of no more than three. A minimum distance of no less than 20 feet shall be maintained between the tree cluster’s mature canopies. The trees will be limbed up to maintain vertical separation from understory shrubs.
- Only those trees on the Approved Plant List (Appendix H) and/or those approved by the biologist and County of San Diego shall be allowed within this zone.
- 75% of all groundcover and sprawling vine masses shall be limited to a maximum height of 36 inches.
- 25% of all groundcover and sprawling vine masses may reach a maximum height of 48 inches.

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- Randomly placed approved succulent type plant material may exceed the height requirements, provided that they are spaced in groups of no more than three.
- Single specimen native shrubs, exclusive of chamise and sage, may be retained, on 20-foot centers.

6.1.1.1 Exception to 100-Foot FMZ

1. The areas designated R-14 and R-15 in Figure 3 are adjacent to an off-site vernal pool. The vernal pool includes a 100 foot buffer that intersects the site's boundary, specifically, it occurs at the Land Exchange Alternative's outer boundary/MSCP boundary for seven lots in R-14 (Lots 11-17) and at the property line for two lots in R-15 (Lots 22 and 23). The vernal pool area includes Proctor Valley Road and its associated FMZ areas, as well as grass dominated landscapes, sparse chaparral as well as moderately dense chaparral vegetation around the vernal pools. Terrain in this area is gently to moderately sloping.

Vernal Pool areas are provided ongoing management by the land manager. This includes removal of exotic species, dead and dying vegetation, and debris. These activities help reduce the potential for flammable vegetation establishment and reduce fuel loads.

In the event that the Land Exchange Alternative is approved by the Board of Supervisors, a Tentative Map condition will be triggered to require Lots 11-18 in R-14 and Lots 22-24 in R-15 to provide a 100' FMZ (provided no vernal pool area is located within the 100'FMZ) or an equivalent combination of FMZ, alternative materials and methods to the satisfaction of the LD and SDCFA. If required, at final engineering a redesign of the lot configuration in these areas to satisfy this condition will be allowed as an administrative approval under the authority of the San Diego County Fire Authority.

2. Depending on the final positioning of the fire station (on the designated Public Safety Site) and multi-family units to the south of the Public Safety Site, the 100 foot wide FMZ's may be reduced to no less than 65 feet. Should this situation be necessary, then the following measures will be implemented as mitigation and to provide equivalent protection as the full 100 feet:
 - a. The entire 65 feet or more will be Zone 1, irrigated zone
 - b. A heat-deflecting landscape wall will be provided at the property line adjacent these properties where 100 feet of FMZ is not achievable
 - c. Residential units will include upgraded windows to dual pane, both panes tempered on the exposed side(s).

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6.2 Other Vegetation Management

6.2.1 Roadside Fuel Modification Zones (Including Driveways)

- High BTU producing, flammable vegetation including shrubs and trees shall be cleared and are prohibited (refer to the prohibited plant list in Appendix I).
- Tree and shrub canopies shall be spaced such that interruptions of tree crowns occur and horizontal spacing of 20 feet between mature canopies of trees or tree groups is maintained.
- Grass shall be mowed to 4 inches.
- Single tree specimens, fire resistive shrubs, or cultivated ground cover such as green grass, succulents or similar plants used as ground covers may be used, provided they do not form a means of readily transmitting fire.
- All roads in the development will have vegetation clearance of flammable vegetation on each side, as follows:
 1. Fire Access Roads (any road that a responding fire engine would use to access an emergency) – 20 feet from edge of pavement
 2. New roads/driveways – 20 feet from edge of pavement
 3. Existing roads/driveways – 10 feet from edge of pavement, including along Proctor Valley Road to the north and south of the Land Exchange Alternative.
- Trees may be placed within Roadside Vegetation Management Zones within the developed portions of the Land Exchange Alternative. The following criteria must be followed:
 1. Tree spacing to be 20 feet between mature canopies (30 feet if adjacent to a slope steeper than 41%).
 2. Trees must be limbed up one-third the height of mature tree or 6 feet, whichever is greater.
 3. No tree canopies lower than 13 feet 6 inches over roadways.
 4. No tree trunks intruding into roadway width.
 5. No trees or other plants on the Prohibited Plant List (Appendix I) are permitted.
 6. No flammable understory is permitted beneath trees.
 7. Any vegetation under trees to be fire resistive and kept to 2 feet in height or below, and no more than one third the height of the lowest limb/branch on the tree.

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6.2.2 San Diego Gas & Electric Easement

A San Diego Gas & Electric (SDG&E) easement occurs along the northern edge of South Proctor Valley Village. This easement will be maintained by SDG&E in accordance with its vegetation management program and standard policies mandated by the California Public Utilities Commission, including the GO 95 rules (CPUC 2015). Accordingly, hazardous fuel conditions will be addressed by SDG&E in a timely manner. The Land Exchange Alternative's provided fuel modification zones adjacent to this area account for the native fuels that occur within this easement.

6.2.3 Trail Vegetation Management

Trails include the Community Pathway that is accessible from public roads and the "optional trail", which occurs along an existing dirt road/trail within the Otay Ranch RMP/MSCP Preserve to the north of the Village 14. Vegetation Management alongside these roads/trails is not permitted within the Otay Ranch RMP/MSCP Preserve. Trail maintenance shall occur on the trails to remove flashy fuels and maintain the trail in a useable, low fuel condition, but does not include removal of fuels along the sides of trails. The HOA/District will maintain trails in the public road ROW. Otay Ranch Preserve Owner/Manager, the State of California, or their designees shall maintain trails within the Otay Ranch RMP/MSCP Preserve. The Community Pathway will be accessible by emergency all-terrain vehicles such as "UTVs" accessed at numerous locations within the community. The optional trail will be accessible from the Land Exchange Alternative via a trail access point and will be wide enough for emergency UTV/ATV access.

6.2.4 Parks and Open Space

- Landscaping within parks, detention basins, and maintained open space areas will be in compliance with the guidelines in this plan as FMZ areas.
- Parks, detention basins and maintained open space areas include 30 feet of Zone 1 fuel modification on the perimeter and the remaining 70 feet (or in some cases, the entire park, basin, etc.) are maintained to Zone 1 standards.

6.2.5 Vacant Parcels and Lots

- Vegetation management will not be required on vacant lots until construction begins. However, perimeter FMZs must be implemented prior to commencement of construction utilizing combustible materials.
- Vacant lots adjacent to active construction areas/lots will be required to implement vegetation management if they are within 30 feet of the active construction area.

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Perimeter areas of the vacant lot shall be maintained as a Vegetation Management Zone extending 30 feet from roadways and adjacent construction areas.

- Prior to issuance of a permit for any construction, grading, digging, installation of fences, etc., on a vacant lot, the 30 feet at the perimeter of the lot is to be maintained as a Vegetation Management Zone.
- In addition to the establishment of a 30-foot-wide vegetation management zone prior to combustible materials being brought into the development area, existing vegetation on the lot shall be reduced by at least 60% upon commencement of construction.
- Dead fuel, ladder fuel (fuel which can spread fire from ground to trees), and downed fuels shall be removed and trees/shrubs shall be properly limbed, pruned and spaced per this plan.

6.2.6 Otay Ranch RMP/MSCP Preserve

A Community Facilities District (CFD), homeowner's association (HOA), Otay Ranch RMP Preserve Owner/Manager or other legal entity approved by the SDCFA Fire Marshal, ("Approved Maintenance Entity") shall obtain permission from the County, and/or the appropriate resource agencies (California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), U.S. Army Corps of Engineers (ACOE)) prior to conducting vegetation management activities within any portion of the Otay Ranch RMP Preserve.

6.2.7 Alternative Methods

The builder or private lot owner may submit a site specific risk assessment and detailed Focused Fire Protection Plan, to the SDCFA Fire Marshal proposing alternative methods of fire protection and providing justification for any variance from the recommended vegetation management zones, if there is a practical difficulty, or environmental constraint, in providing the entire size of the necessary vegetation management zone detailed herein. The VMP will need to fully justify any alternative means and methods/mitigation measures proposed for reductions in the fuel modification areas and is subject to Fire Marshal approval.

6.2.8 Private Residential Lots

This FPP provides direction for community managed and maintained fuel modification zones. It also provides a guide for selecting lower flammability plant material along with planting and maintenance requirements for private lot owners. The 100 feet fuel modification zone will be required to be planted with low flammability plantings consistent with this FPP. In addition, it is recommended that none of the plant materials listed in Appendix I or otherwise known to be

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especially flammable are allowed to be planted on private lots. This FPP, or a summary of its key points, will be provided to all buyers in a private property owner's guide to living in a fire environment. In addition the Land Exchange Alternative Covenants, Conditions, and Regulations (CC&Rs) shall include a reference to the FPP and the HOA's (or similar entity's) landscape committee shall not approve plans including any of the prohibited plant species to ensure compliance with the FPP.

6.2.9 Annual Fuel Modification Maintenance

Vegetation management shall be completed annually by May 1 of each year and more often as needed for fire safety, as determined by the SDCFA. Homeowners and private lot owners shall be responsible for all vegetation management on their lots, in compliance with this FPP which is consistent with SDCFA requirements. The "Approved Maintenance Entity" shall be responsible for and shall have the authority to ensure long term funding, ongoing compliance with all provisions of this FPP, including vegetation planting, fuel modification on the perimeter and within interior maintained common areas, vegetation management, and maintenance requirements on all private lots, multi-family residences, school (SDCFA may inspect schools and enforce fuel modification requirements), parks, common areas, roadsides (including Proctor Valley Road), and open space under their control (if not considered Otay Ranch RMP/MSCP Preserve open space). Any water quality basins, flood control basins, channels, and waterways will be kept clear of flammable vegetation, subject to paragraph 6.2.6, above.

6.2.9.1 Annual FMZ Compliance Inspection

To confirm that the Land Exchange Alternative's common areas are being maintained according to the FPP, the Approved Maintenance Entity shall obtain an inspection and report from a SDCFA-authorized Wildland Fire Safety Inspector, in May of each year, certifying that vegetation management activities throughout the Land Exchange Alternative have been performed pursuant to this FPP. This report will be funded (the maintenance entity would contract with an approved 3rd party inspector) by the Approved Maintenance Entity and submitted to SDCFA for approval.

Vegetation management requirements shall be implemented at commencement and throughout the construction phase. Vegetation management shall be performed pursuant to the FAHJ on all building locations prior to the start of work and prior to any import of combustible construction materials. Adequate fuel breaks of at least 30 feet shall be created around all grading, site work, and other construction activities in areas where there is flammable vegetation.

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In addition to the requirements outlined above, the Land Exchange Alternative will comply with the following important risk-reducing vegetation management guidelines:

- New power lines shall be underground for fire safety during high wind conditions or during fires on a right-of-way that can expose aboveground power lines. Temporary construction power lines may be allowed in areas that have been cleared of combustible vegetation.
- A Construction Fire Prevention Plan shall be prepared to minimize the likelihood of ignitions and pre-plan the Land Exchange Alternative fire prevention, protection and response plan.
- Caution must be used not to cause erosion or ground (including slope) instability or water runoff due to vegetation removal, vegetation management, maintenance, landscaping, or irrigation. Fuel reduction work should include removal of above ground biomass only. No uprooting of treated plants/fuels is necessary.

6.3 Road Requirements

6.3.1 Access

Access Roads

Site access, including road widths and connectivity, will comply with the requirements of the Consolidated County Fire Code (Section 96.1.503 County of San Diego 2017).

- All fire access and vehicle roadways will be of asphaltic concrete or approved pervious pavement and designed and maintained to support the imposed loads of fire apparatus (not less than 75,000 pounds) that may respond, including Type I engines, Type III engines, ladder trucks, and ambulances. Proposed development footprint roads will meet San Diego County Department of Public Works' (DPW) Road Standards. Access roads shall be at a minimum provided first layer of pavement prior to combustible construction occurring.

NOTE: The existing Proctor Valley Road will be improved for its entirety. However, SDCFA agrees to Proctor Valley Road being maintained in its existing condition as a dirt roadway to its connection north with Jamul Road until the last phase of the Land Exchange Alternative is developed. The roadway will be maintained/graded when needed by San Diego County on a more frequent basis to control wash-board conditions during this period.

- Development footprint roads will be constructed to a minimum unobstructed width of 24-foot and shall be improved with aggregate cement or asphalt paving materials. There shall be at least two points of primary access from Proctor Valley Road to each of the

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development areas for emergency response and evacuation. Interior residential streets will be designed to accommodate a minimum of a 75,000-lb. fire truck.

- Fire access roads for each phase shall meet Land Exchange Alternative approved fire code requirements.
- Fire lane road at commercial buildings, and schools (road closest to the building) will be 26 feet wide, per code or as approved by County Fire Marshal.
- Street parking will be provided on one or both sides of residential collector streets, depending on the location within the Land Exchange Area. Parking will be assumed to be 6 to 8 feet in width. Where road widths do not accommodate parking, restrictions will apply, per the DPW Road Modification, and the streets will be posted with signs stating “No Parking; Fire Lane.” Street sections are to be reviewed and approved by the County DPW and the County Fire Marshal.
- Roads with a median or center divider will have 12 feet unobstructed width on both sides of the center median or divider. Emergency fire truck access points will be provided through the center divider at 1,000-foot intervals, where road segment length allows.

Secondary Access

- A minimum of two entrances from Proctor Valley Road to each development area will be provided. The location of these entrances, satisfies the need for secondary access (see Figure 6, Gate and Emergency Access, for location of secondary access points).
- Any dead end roads longer than 150 feet shall have approved provisions for fire apparatus turnaround. Fire apparatus turnarounds will include a turning radius of a minimum 28 feet, measured to the inside edge of improved width (CCFC 96.1.503.2.4 County of San Diego 2017).
- The longest dead-end road (cul-de-sac) allowed by the County Consolidated Fire Code and CCR Title 14 is 800 feet for this community. No dead-end cul-de-sac lengths will exceed 800 feet without proposed mitigations acceptable to the FAHJ.
 - The Land Exchange Alternative complies with secondary access and avoidance of dead-end roads that exceed the allowable 800 feet. Note that in the Southern Proctor Valley Village, Streets “A” and “N” include wider roads and do not have driveways, enabling free traffic flow.

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- Cul-de-sac bulbs are required on dead-end roads in residential areas where roadways serve more than two residences. Cul-de-sacs will be provided with a paved radius of 42 feet to allow for street parking within the cul-de-sac.
- Roadways and/or driveways will provide fire department access to within 150 feet of all portions of the exterior walls of the first floor of each structure.
- Roadway design features (e.g., speed bumps, humps, speed control dips, planters, fountains) that could interfere with emergency apparatus response speeds and required unobstructed access road widths will not be installed or allowed to remain on roadways (County Consolidated Fire Code). Traffic Calming features (i.e., raised intersections, intersection neck downs, roundabouts and parallel bay parking with landscape pop-outs) traffic calming devices may be allowed, subject to approval by the SDCFA and County DPW.
- Vertical clearance of vegetation along roadways will be maintained at 13 feet, 6 inches. Vertical clearance in the commercial areas to be clear to the sky to allow aerial ladder truck operation.
- Angle of driveway/roadway approach/departure will not exceed 7° (12%) per SDCFA.
- Road grades will not exceed 15%, unless approved by the Fire Chief (maximum 20% with mitigations).
- Developer will provide information illustrating the new roads, in a format acceptable to the SDCFA, to update the SDCFA maps (2017 County Fire Code, Section 96.1.505.5).
- Any roads that have traffic lights shall have SDCFA–approved traffic preemption devices (Opticom) compatible with devices on the Fire Apparatus, per SDCFA.

6.3.2 Gates

Access gates will comply with SDCFA codes, Section 96.1.503.6 (County of San Diego 2017). Planned gate locations are illustrated in Figure 6. Public roads shall not be gated. Any gates on private roads or on private driveways may be permitted but must comply with SDCFA standards for electric gates and will not represent a dead end road condition that jeopardizes the dead end road length requirements for this Land Exchange Alternative.

- Access gates are to be equipped with a KNOX key switch, which overrides all command functions and opens the gate. Gates serving more than 4 parcels shall be equipped with sensors for detecting emergency vehicle “opticom” strobe lights and/or sirens from any direction of approach. Strobe detection and key switches will be provided on the interior and exterior of gates.

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- Switches may be dual keyed for SDCFA and Law Enforcement access.
- Gate activation devices will be equipped with a battery backup or manual mechanical disconnect in case of power failure.
- Further, gates will be:
 - Wider than the roadway;
 - Inclusive of area lighting;
 - Constructed from non-combustible materials;
 - Inclusive of provisions for manual operation from both sides, if power fails. Gates will have the capability of manual activation from the development side, via contact by a person or a vehicle (including a vehicle detection loop);
 - Located 30 feet from any intersecting road; and
 - Operable by activation with fire truck radio.

6.3.3 Driveways

Any structure that is 150 feet or more from a common road in the development footprint shall have a paved driveway meeting the following specifications:

- Grades less than 20% with surfacing and sub-base consistent with the County of San Diego Parking Design Manual;
- Driveways serving two houses or fewer will be 16 feet wide unobstructed with a fire apparatus turnaround. Driveways serving more than two houses will be 24 feet wide unobstructed;
- Addresses shall be posted at the entrance to each driveway if house numbers are not visible from the street; and
- Driveway gates to comply with section 6.3.2, above.

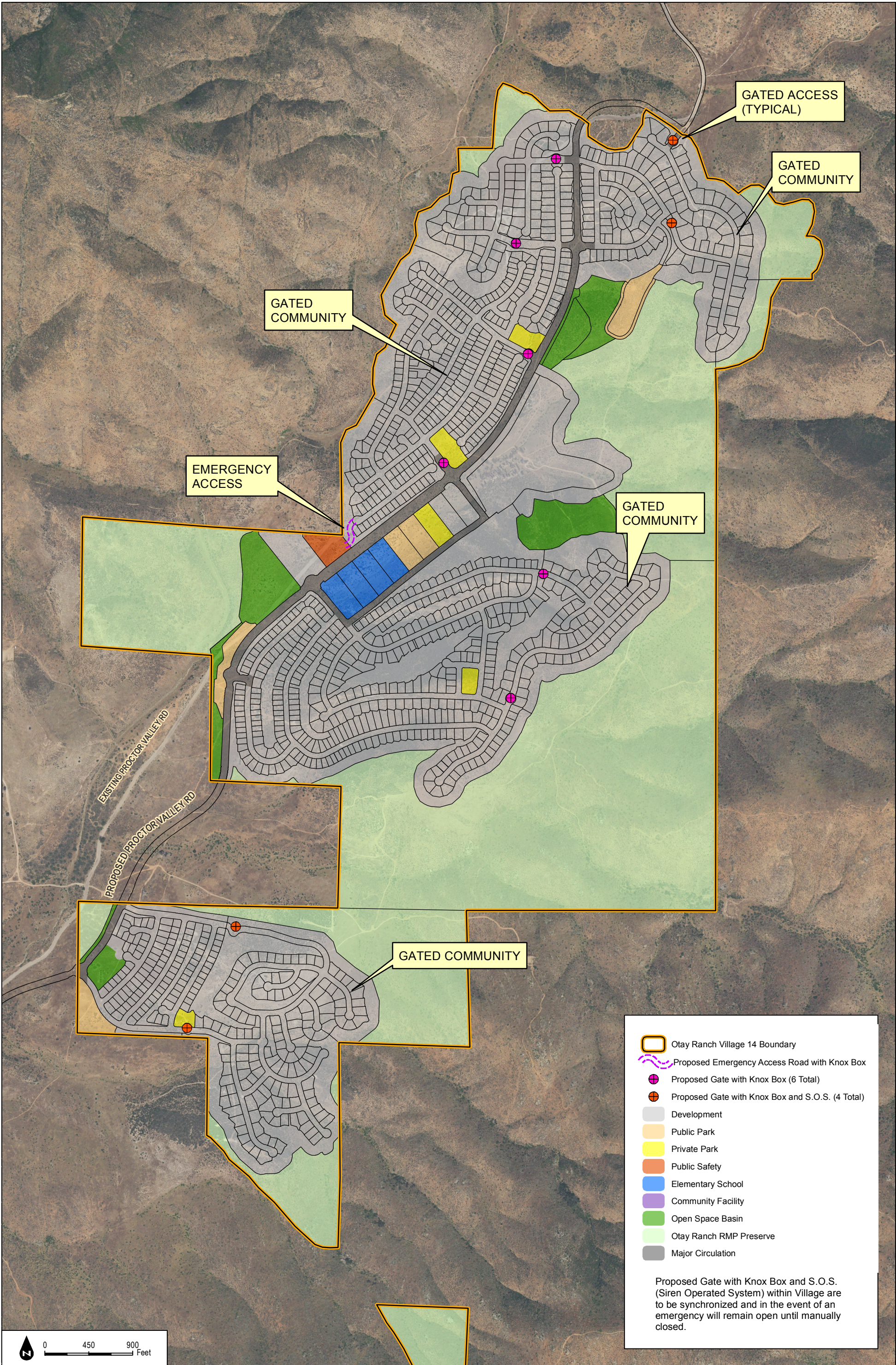


Figure 6
Gates and Emergency Access

SOURCE: Hunsaker 2017

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Identification of roads and structures will comply with 2017 CFC, Section 96.1.505, as follows:

- All structures shall be identified by street address numbers at the structure. Numbers will be 4 inches in height, 0.5-inch stroke, and located 6 to 8 feet above grade. Addresses on non-residential buildings shall be 6 inches high with 0.5-inch stroke. Address numbers will contrast with background.
- Multiple structures located off common driveways will include posting addresses on structures, on the entrance to individual driveways, and at the entrance to the common driveway for faster emergency response.
- Structures 100 feet or more from a roadway will include numbers at the entrance to the driveway.
- Proposed roads within the development will be named, with the proper signage installed at intersections to the satisfaction of the SDCFA and the DPW (County of San Diego Standard DS-13).
- Streets will have street names posted on non-combustible street signposts. Letters/numbers will be 4 inches high, reflective, on a 6-inch-high backing. Signage will be 7 feet above grade. There will be street signs at the entrances to the development, all intersections, and elsewhere as needed subject to approval of the Fire Chief.
- Access roads to private lots to be completed and paved prior to lumber drop and prior to the occurrence of combustible construction.

6.4 Structure Requirements

6.4.1 Ignition-Resistance

This section outlines ignition-resistant construction (for all structures) that will meet the requirements of the 2017 Consolidated County Fire Code and the County Building Code (SD County Code of Regulatory Ordinance; Title 9, Division 2), Chapter 701--A. The following construction practices respond to the requirements of these codes and are consistent with the 2016 California Fire and Building Codes (Chapter 7A). Code updates are likely to occur before the Land Exchange Alternative is fully constructed. As such, building plans must meet the “then-current” County Building Code in effect at the time of building plan submittal. Appendix J, Ignition Resistance Construction Requirements, provides a summary of the requirements for ignition resistant construction.

There are two primary concerns for structure ignition: radiant and/or convective heat and burning embers (IBHS 2008; NFPA 2018). Burning embers have been a focus of building code updates

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for at least the last decade, and new structures in the WUI built to these codes have proven to be very ignition resistant.

Likewise, radiant and convective heat impacts on structures have been minimized through the CBC Chapter 7A exterior fire ratings for walls, windows and doors. Additionally, provisions for modified fuel areas separating wildland fuels from structures have reduced the number of fuel-related structure losses. As such, most of the primary components of the layered fire protection system provided the Land Exchange Alternative are required by the County, SDCFA, and state codes. However, these requirements are worth listing because they have proven effective for minimizing structural vulnerability to wildfire and, with the inclusion of required interior sprinklers (required in the 2010 Building/Fire Code update), of extinguishing interior fires, should embers succeed in entering a structure. Even though these measures are now required by the latest Building and Fire Codes, at one time, they were used as mitigation measures for buildings in WUI areas, because they were known to reduce structure vulnerability to wildfire. These measures performed so well, they were adopted into local and state codes. For instance, San Diego County after-fire assessments, indicate strongly that the building codes are working in preventing home loss: of 15,000 structures within the 2003 fire perimeter, 17% (1,050) were damaged or destroyed. However, of the 400 structures built to the 2001 codes (the most recent at the time), only 4% (16) were damaged or destroyed. Further, of the 8,300 homes that were within the 2007 fire perimeter, 17% were damaged or destroyed. A much smaller percentage (3%) of the 789 homes that were built to 2001 codes were impacted and an even smaller percentage (2%) of the 1,218 structures built to the 2004 Codes were impacted (IBHS 2008). It has been reasoned that by fire officials conducting after-fire assessments that damage to the structures built to the latest codes is likely from unmaintained flammable landscape plantings or objects next to structures or open windows or doors (Hunter 2008). The building codes developed for construction in high and very high fire hazard zones is working to minimize the vulnerability of new residences and other structures to wildfires. There are numerous examples of master planned communities built to ignition resistant standards and include HOA managed fuel modification zones that have been tested by wildfire and functioned as they were intended. The Land Exchange Alternative incorporates a fire protection system that has been found by after-action fire reports, independent researchers, as well as USGS researchers (2013) to perform well against wildfires. Newer communities, especially those within jurisdictions that have adopted the latest State Fire and Building Codes (like San Diego County), and that have a well-defined fuel modification zone requirement, perform well against wildfires. Examples include Cielo in Rancho Santa Fe, 4S Ranch in San Diego, Stevenson's Ranch in Santa Clarita, Serrano Heights in Orange County and many others in Southern California.

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The following features are required for new development in WUI areas and form the basis of the system of protection necessary to minimize structural ignitions as well as providing adequate access by emergency responders:

While these standards will provide a high level of protection to structures in this development, and should reduce the potential for ordering evacuations in a wildfire, there is no guarantee that compliance with these standards will prevent damage or destruction of structures by fire in all cases.

1. Exterior walls of all structures and garages to be constructed with approved non-combustible (stucco, masonry, or approved cement fiber board) or ignition-resistant material from grade to underside of roof system. Wood shingle and shake wall covering is prohibited. Any unenclosed under-floor areas will have the same protection as exterior walls. Per County Building Code, Chapter 7-A: Exterior wall coverings to extend from top of foundation to the underside of roof sheathing, and terminate at 2-inch nominal solid wood blocking between rafters at all roof overhangs, or in the case of enclosed eaves, terminate at the enclosure). The underside of any cantilevered or overhanging appendages and floor projections will maintain the ignition-resistant integrity of exterior walls, or projection will be enclosed to grade.
2. Eaves and soffits will meet the requirements of SFM 12-7A-3 or be protected by ignition-resistant materials or non-combustible construction on the exposed underside, per County Building Code, Chapter 7-A.
3. There shall be no use of paper-faced insulation or combustible installation in attics or other ventilated areas per County Building Code.
4. There shall be no use of plastic, vinyl (with the exception of vinyl windows with metal reinforcement and welded corners), or light woods on the exterior.
5. All roofs shall be a Class “A” listed and fire-rated roof assembly, installed per manufacturer’s instructions, to approval of the SDCFA. Roofs shall be made tight with no gaps or openings on ends or in valleys, or elsewhere between roof covering and decking, in order to prevent intrusion of flame and embers. Any openings on ends of roof tiles shall be enclosed to prevent intrusion of burning debris. When provided, roof valley flashings shall not be less than 0.019 inch (No. 26 gage galvanized sheet) corrosion-resistant metal installed over a minimum 36-inch-wide underlayment consisting of one layer of 72 pound ASTM 3909 cap sheet running the full length of the valley (County Building Code, Chapter 7-A).

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6. No vents in soffits, cornices, rakes, eaves, eave overhangs or between rafters at eaves or in other overhang areas. Gable end and dormer vents to be at least 10 feet from property line or provided alternative design resistant to ember penetration. Vents in allowed locations to be protected with wire mesh having no openings greater than 0.125 inch. Vent openings shall not exceed 144 square inches. Vents shall be designed to resist the intrusion of any burning embers or debris (County Building Code, Chapter 7-A).
7. Vents shall not be placed on roofs unless they are approved for Class “A” roof assemblies (and contain an approved baffle system (such as Brandguard vents) to stop intrusion of burning material) or are otherwise approved.
8. Turbine vents are prohibited.
9. Exterior glazing in windows (and sliding glass doors, garage doors, or decorative or leaded glass in doors) to be dual pane with one tempered pane, or glass block or have a 20-minute fire rating. Glazing to comply with CBC Chapter 7-A.
10. Any vinyl frames to have welded corners and metal reinforcement in the interlock area to maintain integrity of the frame certified to ANSI/AAMA/NWDA 101/LS 2 97 requirements.
11. Skylights to be tempered glass (County Building Code, Chapter 7-A).
12. Rain gutters and downspouts to be non-combustible. They shall be designed to prevent the accumulation of leaf litter or debris, which can ignite roof edges (County Building Code, Chapter 7-A).
13. Doors to conform to SFM standard 12-7A-1, or shall be of approved noncombustible construction or shall be solid core wood having stiles and rails not less than 13/8 inches thick or have a 20-minute fire rating. Doors to comply with County Building Code, Chapter 7-A. Garage doors to be solid core 1.75-inch-thick wood or metal, to comply with code.
14. Decks and their surfaces, stair treads, landings, risers, porches, balconies to comply with language in County Building Code, Chapter 7-A and be ignition-resistant construction, heavy timber, exterior approved fire retardant wood, or approved non-combustible materials.
15. Decks or overhangs projecting over vegetated slopes are not permitted. Decks to be designed to resist failing due to the weight of a firefighter during fire conditions. There will be no plastic or vinyl decking or railings. The ends of decks to be enclosed with the same type of material as the remainder of the deck.
16. There shall be no combustible awnings, canopies, or similar combustible overhangs.
17. No wood fences to be allowed within 5 feet of structures on any lots. The first 5 feet from a structure will be non-combustible or meet the same fire resistive standards as walls. The

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exception is that a wood gate may be used adjacent to a structure, if there is a 5-foot length of non-combustible or fire-resistive fencing between the gate and the remainder of the fence where it abuts the structure.

18. All chimneys and other vents on heating appliances using solid or liquid fuel, including outdoor fireplaces and permanent barbecues and grills, to have spark arrestors that comply with the County Fire Code. The code requires that openings be maximum 0.5 inch. Arrestors shall be visible from the ground
19. Any liquid propane gas LPG tanks (except small barbecue and outdoor heater tanks), firewood, hay storage, storage sheds, barns, and other combustibles shall be located at least 30 feet from structures, and, within the fuel modification zone, 30 feet from flammable vegetation. There shall be no flammable vegetation under or within 30 feet of LPG tanks, or tanks shall be enclosed in an approved ignition-resistant enclosure with 10 feet clearance of flammable vegetation around it. In no case shall a tank be closer than 10 feet from the structure (consultant recommendation). County Fire Code requires 10 feet of clearance of native vegetation, weeds, and brush from under and around LPG tanks.
20. Storage sheds, barns, and outbuildings to be constructed of approved non-combustible materials, including non-combustible Class A roofs and shall be subject to the same restrictions as the main structure on lot.
21. Additionally, any of the above-listed structures (i.e., outbuildings, storage sheds, barns, separate unattached garages) that are greater than 500 square feet in size shall be equipped with automatic fire sprinklers. Locations, and required fuel modification zones, will be subject to approval of County Fire Marshal and the Building Official based on size of the structure.

6.4.2 Enhanced Defensible Space

The Land Exchange Alternative proposes to provide enhanced defensible space by strategically locating non-combustible walls for some perimeter lots abutting open space that also include a condition where structures are located at the top of a slope. The purpose of these walls is to enhance the protection provided by the FMZs as well as to provide a measure consistent with meeting the intent of top of slope structure setbacks.

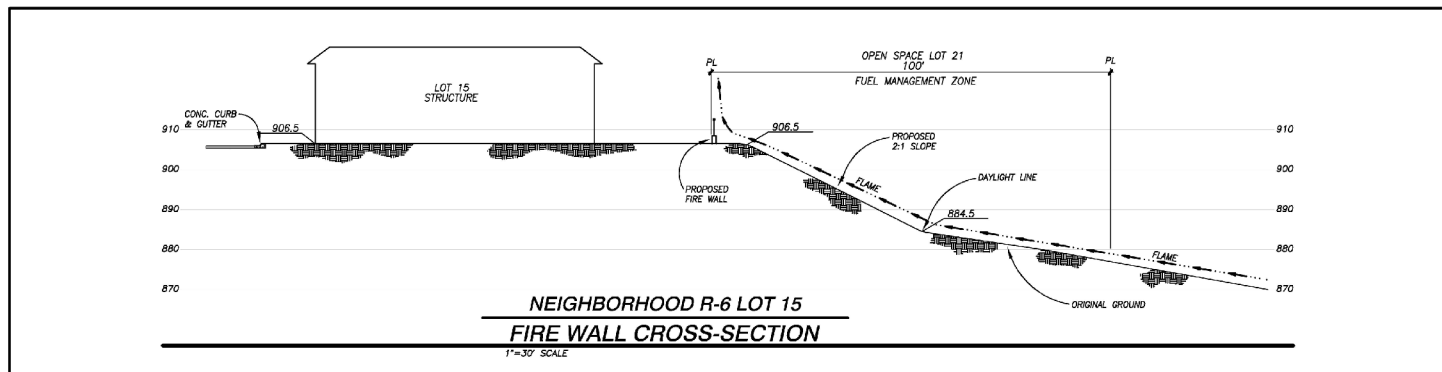
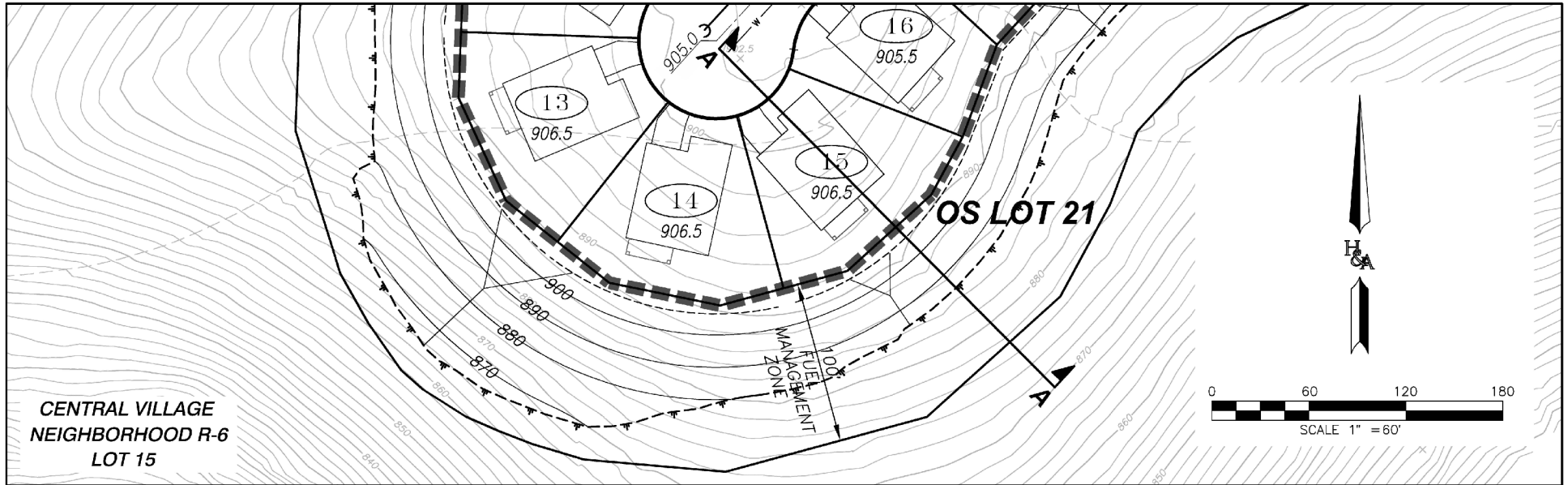
Some jurisdictions require structures to be set back from top of slope when adjacent to wildland areas. This is not required by SDCFA. However, Dudek determined that providing strategically located walls within the development footprint will result in additional protection by deflecting heat and flames away from structures, as indicated in Appendix K, Fire Wall Plan.

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The Land Exchange Alternative's exterior lots adjacent to slopes provide opportunities to place a non-combustible, 6-foot-tall, heat-deflecting wall to provide additional deflection for these lots. When buildings are set back from slopes, and a wall is placed at the top of slope, flames spreading up those slopes are deflected vertically and over the structure where cooling occurs, reducing the effects of convective heat on the structure (Figures 7 through 9). If a structure cannot be setback adequately, or where the slope is less than 30%, a noncombustible wall can help deflect the flames from the structure (NFPA 2018). The duration of radiant heat impact on the downhill facing side of the house is also reduced. An imaginary line extended along the slope depicts the path of the heat (hot air rises) and flame. The structure set back is important to avoid heat and/or flame intersection with the structure.

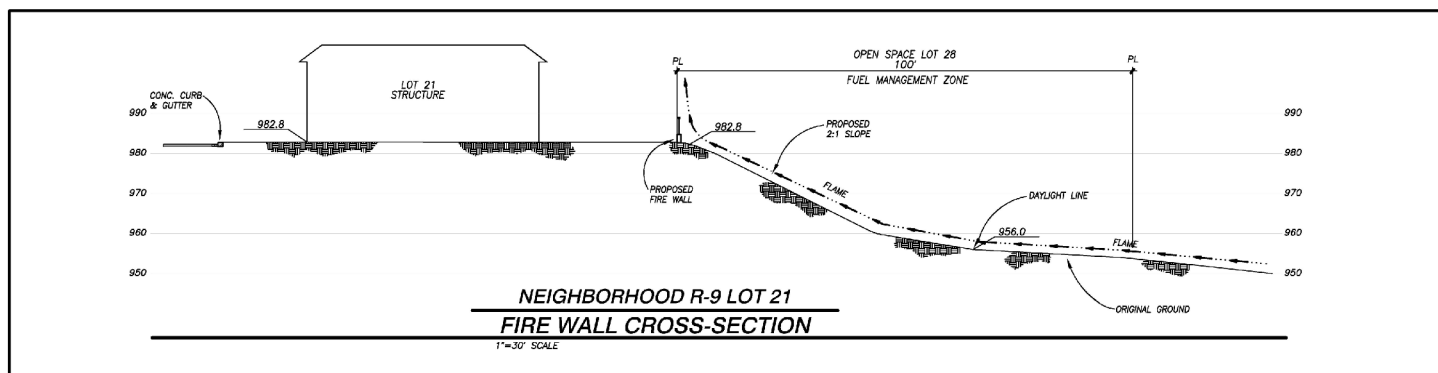
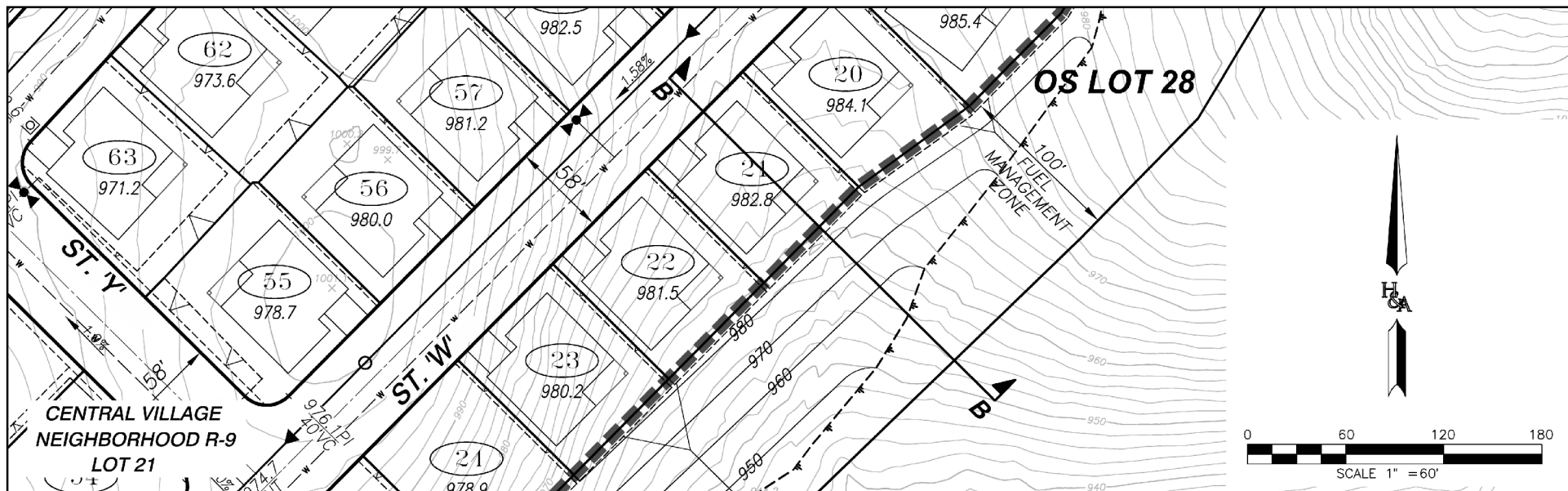
Heat-deflecting landscape view walls of masonry construction with fire-rated glazing that are 6 feet in height (roughly lower 2 feet masonry construction and upper 3 feet dual pane, one pane tempered glazing or equivalent) will be incorporated at top of slope/edge of lots adjacent to down-slopes (Figures 7 through 9) as an enhancement to provided fuel modification zones and defensible space. The landscape walls provide a vertical, non-combustible surface in the line of heat, fumes, and flame travel up the slope. Once these fire byproducts intersect the wall, they are deflected upward or, in the case where lighter fuels are encountered, they are quickly consumed, heat and flame are absorbed or deflected by the wall, and the fuels burn peaks out within a short (30 second–2 minute) time frame (Quarles and Beall 2002). If glass is used for view purposes, final determination as to actual type of listed glazing assembly will be subject to County Fire Marshal and Building Official approval.

Heat-deflecting landscape walls proposed at certain locations for the Land Exchange Alternative have proven to deflect heat and airborne embers during numerous wildfires in San Diego, Orange, Los Angeles, Ventura, and Santa Barbara Counties. Rancho Santa Fe Fire Protection District, Laguna Beach Fire Protection District, Orange County Fire Authority, and others entities use these walls as Alternative methods based on observed performance during wildfires. This has led to these agencies approving use of non-combustible landscape walls as mitigations for reduced FMZs and reduced setbacks at top of slope. These walls are consistent with National Fire Protection Association (NFPA) 1144 Standard for Reducing Structure Ignition Hazards from Wildland Fire – 2018 Edition, Section 5.1.3.3 (NFPA 2018) and A.5.1.3.3, and International Urban Wildland Interface Code. NFPA 1144, A.5.1.3.3 states: “Noncombustible walls and barriers are effective for deflecting radiant heat and windblown embers from structures” (NFPA 2018). These walls and barriers are usually constructed of noncombustible materials (concrete block, bricks, stone, stucco) or earth with emergency access openings built around a development where 30 feet (9 meters) of defensible space is not available.



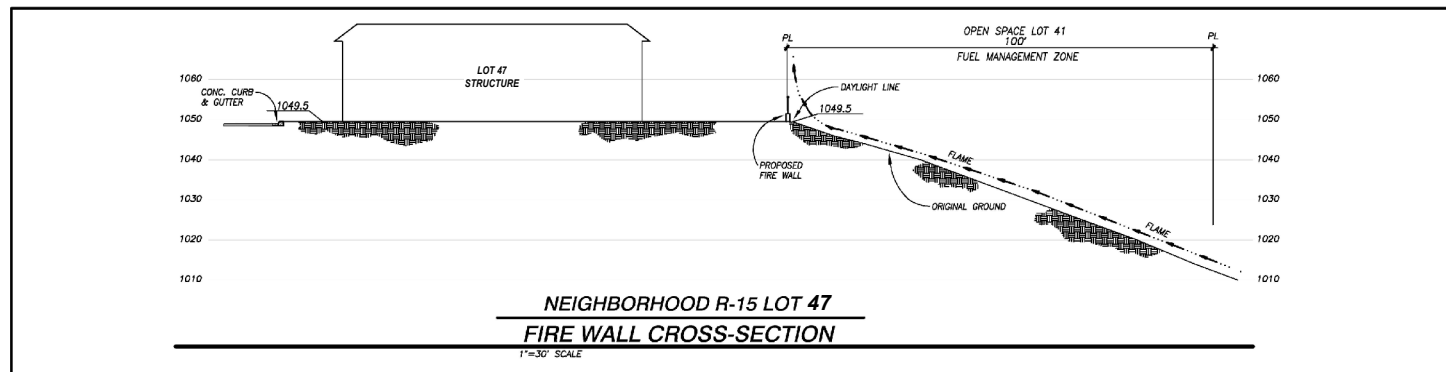
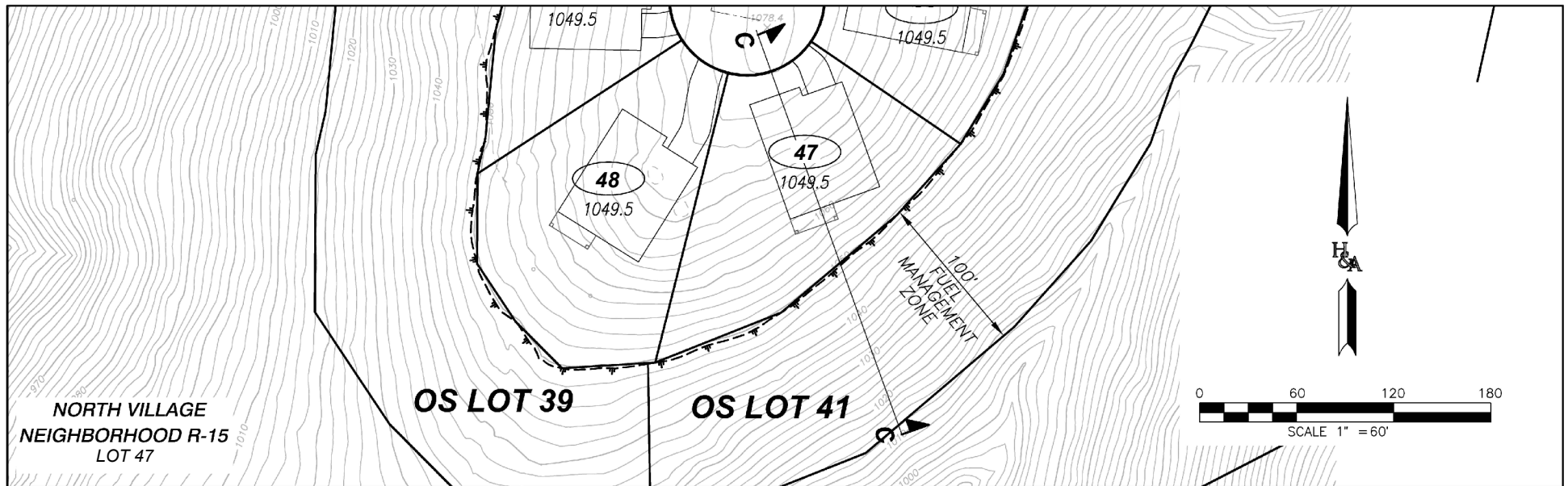
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6.4.3 Fire Protection System Requirements

Infrastructure, Structural Fire Protection, and Fire Protection Systems

WUI fire protection requires a systems approach, which includes the components of vegetation management, structural safeguards (both previously addressed), and adequate infrastructure. This section provides recommendations for infrastructure components:

Infrastructure Recommendations

The following conceptual recommendations are made in order to comply with the SDCFA requirements, the California Fire Code, the County Consolidated Fire Code and nationally accepted fire protection standards, as well as additional requirements to assist in providing fire protection.

Water service will be provided by the Otay Water District. All water storage and hydrant locations, mains and water pressures will be designed to fully comply with San Diego County Fire Code Fire Flow Requirement. Water supply must meet a 2-hour fire flow requirement of 2500 gpm with 20-psi residual pressure, which must be over and above the daily maximum water requirements for this development, as confirmed in the Land Exchange Alternative's Water Technical Study (Overview of Water Service for the Land Exchange Alternative; Dexter Wilson 2017).

Fire Hydrants

- Hydrants are subject to SDCFA approval. Hydrants will be located on the normal Fire Apparatus response side of the road at each intersection and at 350-foot spacing as required by the SDCFA. Where applicable, hydrants will be located at the entrance to cul-de-sac bulb (not in the bulb itself). Hydrants will be provided on each side of any divided road or highway.
- The water system for fire protection will be an approved water supply with hydrants and mains. Fire flow in the mains for residential occupancies will be at least 2,500 gallons per minute (gpm) in fire mains with a 20-psi residual at periods of maximum peak domestic demand. Fire flow for the multifamily, resort, and commercial occupancies will be a minimum of 2,500 gpm in fire mains and to County Consolidated Fire Code. No credit for sprinklers is available in wildfire prone areas. Duration of flow is 2 hours or more if required by the County Consolidated Fire Code based on the required flow. The amount of stored water for fire protection will be for the required duration (minimum 2 hours) at the worst-case fire flow at times of maximum peak domestic and commercial demand (including agriculture). Any private water systems will comply with National Fire

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Protection Association (NFPA) 22 and 24. In addition, fire protection water systems will comply with American Water Works Association Standard M-31; “Distribution Requirements for Fire Protection.”

- Hydrants will have one 2.5-inch outlet and one 4-inch outlet and be of bronze construction per the District Fire Code. Hydrants at commercial buildings, and school to have two 4-inch outlets and one 2.5-inch outlet. Fire protection engineer to make determination whether dry barrels are necessary due to freeze potential.
- Hydrants will have a 3×3 concrete pad at base (gravel if dry barrel hydrant) for weed control.
- Reflective blue dot hydrant markers (minimum 3-inch square) will be installed in the street to indicate location of the hydrant. The lateral shut-off valve will be located in the street 10–25 feet in front of hydrant.
- Crash posts will be provided where vehicles could strike fire hydrants, fire department connections, etc.

Fire Sprinklers

All structures, of any occupancy type, are required by the SDCFA to have internal fire sprinklers. (Exception may be granted by SDCFA for detached accessory structures under 500 square feet). One- and two-family residences may have NFPA 13-D systems. Residential structures 7,000 square feet and larger may be required to have a 4-head calculation. Enclosed patios porches, workshops, barns, storage structures, separate unattached garages, RV structures, and auxiliary use rooms over 500 square feet are also required to have sprinkler protection.

All other occupancies in this development shall have fire sprinklers in compliance with the SDCFA requirements and the applicable NFPA 13 standard. All systems other than single-family detached dwelling systems to be remotely supervised to an approved 24/7 alarm company.

Fire Alarm Systems

- All residential units shall have electric-powered, hard-wired smoke detectors in compliance with Consolidated Fire Code.

6.4.4 Additional Requirements and Recommendations Based on Occupancy Type

This section includes conceptual occupancy-specific recommendations based on the type of occupancy.

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Additional Commercial and School Building Requirements and Recommendations

All retail, commercial, and office buildings will comply with appropriate building codes. The schools will comply with California State Architects Office requirements. Construction in this area will comply with CBC, Chapter 7-A, and shall comply with other state requirements for fire safety. Access, water supply, and hydrant plans for the schools are subject to SDCFA approval.

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7 WILDLAND FIRE EVACUATION PLAN

Early evacuation for any type of wildfire emergency at the Land Exchange Alternative is the preferred method of providing for resident safety, consistent with the SDCFA's current approach within San Diego County. As such, the Land Exchange Alternative's HOA will formally adopt, practice, and implement a "Ready, Set, Go!" (International Fire Chiefs Association 2013) approach to site evacuation. The "Ready, Set, Go!" concept is widely known and encouraged by the state of California and most fire agencies. Pre-planning for emergencies, including wildfire emergencies, focuses on being prepared, having a well-defined plan, minimizing potential for errors, maintaining the site's fire protection systems, and implementing a conservative (evacuate as early as possible) approach to evacuation and site uses during periods of fire weather extremes.

Support for the "Ready, Set, Go!" model is provided by the Wildland Fire Evacuation Plan (WFEP) for the Land Exchange Alternative. The WFEP utilizes existing information from San Diego County Office of Emergency Services (OES) and a standard template, as described on the County OES Web site (<http://www.sdcountry.ca.gov/oes/>). The WFEP will be reviewed to confirm it provides Land Exchange Alternative residents with potential egress route information and instructions for following the "Ready, Set, Go!" model. The WFEP provides site specific procedures for various emergency situations, including wildfire, and once complete, will be made available to the Land Exchange Alternative's residents and commercial tenants. The WFEP will be reviewed by residents at least annually through organized meetings and educational outreach by the HOA, Community Services District, or other means.

The WFEP forms the backbone of hazard relocation/evacuation planning for the Land Exchange Alternative. Wildfire emergencies are one component of the WFEP. Among the important concepts that are included in the WFEP are hazard identification, a description of the area's environment, mitigation strategies, law enforcement, fire agencies and contact information, homeowner education materials, preparedness checklist, route planning, and specific procedures for early relocation as well as contingency planning for situations where evacuation is considered unsafe.

This FPP provides considerable information that is integrated into the WFEP. Climate, vegetation, topography, wildfire hazards, fire agencies, and other descriptive information in this FPP are utilized in the WFEP. Additionally, this FPP outlines important relocation considerations that were integrated into the WFEP, as described in the following sections.

Note that large-scale evacuations during wildfire or other emergencies are managed by agencies including the Office of Emergency Services, law enforcement, and fire agencies. Emergencies are often fluid events and on-scene emergency personnel provide key information and direction

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regarding evacuations. The WFEP is a baseline document, focusing on evacuation routes and pre-planning/preparedness. However, actual evacuation procedures will be a case by case basis and managed and controlled by the aforementioned agencies.

7.1 Wildfire Education

Residents and occupants of commercial facilities will be provided on-going education regarding wildfire, the WFEP, and this FPP's requirements. This educational information will support the fire safety and relocation features/plans designed for this community. Informational handouts, community Web-site page, mailers, fire safe council participation, inspections, and seasonal reminders are some methods that will be used to disseminate wildfire and relocation awareness information. SDCFA will review and approve all wildfire educational material/programs before printing and distribution.

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8 CUMULATIVE IMPACT ANALYSIS

Cumulative impacts from multiple projects within a fire agency's jurisdiction, such as SDCFA can cause fire response service decline and must be analyzed. The Land Exchange Alternative represents a substantial development that would increase the existing call volume by 1.3 calls per day, on average. The resulting impact on fire services has been analyzed within this report and despite the population increase and anticipated call volume increase, the existing fire service delivery system is considered underutilized on a call volume basis, per an analysis of SDCFA call volume statistics³ and has capacity to serve the Land Exchange Alternative. When compared to standard utilization rates for busy (5 or 6 calls per day for a rural station) fire stations (Hunt 2010), it is clear there is capacity to serve the Land Exchange Alternative.

However, the system needs to be augmented to respond to a population change like that associated with this Land Exchange Alternative within a fast timeframe. The County General Plan's 5-minute travel time standard is one part of the process for determining whether existing fire departments can respond to a project or whether additional resources are necessary. Further, when considered cumulatively with other potential projects planned in the area or within automatic aid response areas, the cumulative impact is considered potentially significant.

Despite the minor increase in number of calls per year from the Land Exchange Alternative, it contributes to the cumulative impact on fire services, when considered with other anticipated projects within the SDCFA's primary response area. The largest potential project in addition to the Land Exchange Alternative in this portion of SDCFA's jurisdictional area is Otay Ranch Resort Village (Village 13), which is pending approvals. Village 13 is anticipated to generate up to 1.8 calls per day and is situated in a portion of the SDCFA that cannot be completely responded to within the County's 5 minute travel time from existing stations. Village 13, like the Land Exchange Alternative, has been conditioned to provide a fire station that will meet the General Plan standard and be capable of responding to and assisting with calls beyond the Land Exchange Alternative. Based on the Land Exchange Alternative and the Village 13 project, SDCFA has committed to realigning resources to better serve the area. Therefore, this portion of the County will have enhanced fire and emergency medical service if one or both projects are approved. These additional stations, if the Village 13 and/or the Land Exchange Alternative are approved and built, will mitigate cumulative impacts associated with them along with numerous smaller developments that may occur in the area.

³ SDCFA Fire Station 36 currently responds to about 1.0 call per day (2012 statistics).

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The Land Exchange Alternative's contributions to fire resources through building a new fire station on the Public Safety Site, along with providing funding for equipment and ongoing operations and maintenance, are expected to enhance SDCFA's response capabilities and enhance the current standards for firefighting and emergency response in this portion of the SDCFA.

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9 CONCLUSION

This FPP has been prepared for the proposed Land Exchange Alternative. This FPP complies with the requirements of the 2017 County Consolidated Fire Code and the 2016 California Fire and Building Codes. The recommendations in this document meet fire safety, building design elements, infrastructure, fuel management/modification, and landscaping recommendations of the applicable codes. The recommendations provided in this FPP have been designed specifically for the proposed construction of structures within a WUI area.

When properly implemented on an ongoing basis, the fire protection strategies proposed in this FPP should significantly reduce the potential fire threat to vegetation on the Land Exchange Alternative and its structures and should assist the SDCFA in responding to emergencies in the Land Exchange Area. The Land Exchange Alternative's fire protection system includes a redundant layering of protection methods that have been shown through post-fire damage assessments to reduce risk of structural ignition. Modern infrastructure will be provided along with implementation of the latest ignition resistant construction methods and materials. Further, all structures are required to include interior, automatic fire sprinklers consistent with the fire codes. Fuel modification will occur on perimeter edges adjacent to Otay Ranch RMP/MSCP Preserve areas, as well as throughout the interior of the Land Exchange Alternative. This is a conceptual plan, which provides enough detail for SDCFA approval. Detailed plans, such as improvement plans, building permits, etc., demonstrating compliance with the concepts in this plan and with Fire Code requirements shall be submitted to the fire authority at the time they are developed.

Based on the results of this FPP's analysis and findings, the FPP implementation measures presented in Table 7 summarize code required measures while Table 8 summarizes measures offered that are code exceeding or mitigating through alternative means and methods.

Table 7
Code Required Fire Safety Features

Feature No.	Features Description
1	Ignition Resistant Construction. Buildings will be constructed of ignition resistant construction materials based on the latest Building and Fire Codes.
2	Interior Fire Sprinklers. All structures over 500 square feet will include interior fire sprinklers.
3	Fuel Modification Zones. Provided throughout the perimeter of the Land Exchange Area and will be up to 120 feet wide in most locations, including the rear yard areas as part of the modified zone. Maintenance will occur as needed and the HOA will annually hire a 3rd party, SDCFA-approved, FMZ inspector to provide annual certification that it meets the requirements of this FPP.

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**Table 7
Code Required Fire Safety Features**

Feature No.	Features Description
4	Roadside Fuel Modification Zones. Roadside FMZs will be consistent with the code and include 10 feet along Proctor Valley Road and 20 feet for Land Exchange Alternative new roads.
5	Fire Apparatus Access. Provided throughout the Land Exchange Area and will vary in width and configuration, but will all provide at least the minimum required unobstructed travel lanes, lengths, turnouts, turnarounds, and clearances required by the applicable code.
6	Firefighting Improvements. Firefighting staging areas and temporary refuge areas are available throughout the Land Exchange Alternative's developed areas, and along roadways and site green spaces.
7	Water Availability. Water capacity and delivery will provide for a reliable water source for operations and during emergencies requiring extended fire flow.
8	Land Exchange Area Fire Station. Emergency response travel time consistent with the San Diego County General Plan requirement for the Land Exchange Alternative will be provided by a Land Exchange Area fire station. Travel times to all portions of the Land Exchange Area will be, less than 5 minutes, consistent with the County General Plan standards.

**Table 8
Code Exceeding or Alternative Materials and Methods Fire Safety Measures**

Measure No.	Code Exceeding or Alternative Material or Method Measure
1	Construction Fire Prevention Plan. Details the important construction phase restrictions and fire safety requirements that will be implemented to reduce risk of ignitions and pre-plans for responding to an unlikely ignition.
2	Community Evacuation Plan. A site-specific evacuation plan will be prepared for the Land Exchange Alternative and will include input and review with SDCFA Code Exceeding).
3	HOA Wildfire Education and Outreach. The Community HOA will include an outreach and educational role to coordinate with SDCFA, oversee landscape committee enforcement of fire safe landscaping, ensure fire safety measures detailed in this FPP have been implemented, and educate residents on and prepare facility-wide "Ready, Set, Go!" plans. (Code Exceeding)
4	Heat Deflecting Landscape Walls. Walls will be provided for up to 38 lots to provide additional fire protection and to enhance structure setback from top of slope. At a few locations, where FMZ is constrained to approximately 70 feet, walls will be provided as mitigation to provide same practical effect. (ALTERNATIVE MATERIALS AND METHODS FOR FMZ REDUCTIONS IN SOME LOCATIONS. ALSO A CODE EXCEEDING MEASURE AS IT IS NOT REQUIRED FOR STRUCTURE SETBACK)
5	Fuel Modification Zone 3rd Party Inspections. Annual FMZ inspections will be funded by the HOA and conducted by a qualified third-party consultant to certify that the Land Exchange Alternative's FMZs are maintained and LBZ/LBA have no authorized structures. (Code Exceeding)
6	Trail Maintenance. Provided trails will include ongoing maintenance of flammable vegetation, not including alongside trails (Code Exceeding).
7	Wider Roads and Driveway Exclusion. In South Village 14, Streets "A" and "N" include wider roads and do not have driveways, enabling free traffic flow and enhanced evacuation capability. (Code Exceeding)

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Fire is a dynamic and somewhat unpredictable occurrence and as such, this FPP does not guarantee that a fire will not occur or will not result in injury, loss of life or loss of property. There are no warranties, expressed or implied, regarding the suitability or effectiveness of the recommendations and requirements in this plan, under all circumstances.

The developers, contractors, engineers, and architects are responsible for proper implementation of the concepts and requirements set forth in this FPP. Homeowners and property managers are responsible to maintain their structures and lots as required by this FPP, the SDCFA, and as required by the Fire Code. Alternative methods of compliance with this FPP can be submitted to the fire authority and County Fire Marshal for consideration.

It will be extremely important for all homeowners, property managers, and occupants to comply with the recommendations and requirements described and required by this FPP on their property. The responsibility to maintain the fuel modification and fire protection features required for this Land Exchange Alternative lies with the homeowners and business owners. The HOA or similar entity will be responsible for ongoing education and maintenance of the common areas, while the fire authority will enforce the vegetation management requirements detailed in this PFPP. Such requirements shall be made a part of deed encumbrances and CC&Rs for each lot, as appropriate.

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